

*BYDUS, N.M.*  
BYDUS, N.M.

Vladivostok School of Pharmacy. Apt.delo 6 no.6:41-42 N-D '57.  
(MIRA 10:12)

1. Direktor Vladivostokskogo farmatsevticheskogo uchilishcha.  
(VLADIVOSTOK--PHARMACY--STUDY AND TEACHING)

EYDUS, N.M.

~~Eliminate shortcomings in training subordinate pharmaceutical~~  
~~personnel. Apt.delo 7 no.3:37 My-Je '58~~ (MIRA 11:7)

1. Iz Vladivostokskogo farmatsevticheskogo uchilishcha.  
(PHARMACY--STUDY AND TEACHING)

EYDUS, YA. [Eiduss, J.]; MUTSENIETSE, L. [Muceniece, L.]

Ultraviolet absorption spectra of nitrofurans. Vestis Latv  
ak no.11:65-82 '61.

EYDUS, Ya. [Eiduss, J.]

Prominent physicist August Toepler of the 19th century and his  
work in Riga. Izv.AN Latv.SSR no.2:128-130 '63. (MIRA 16:4)  
(Toepler, August Joseph Ignaz, 1836-1912)

ACC NR: AP7009580

SOURCE CODE: UR/0259/66/000/011/0005/0008

AUTHOR: Eyduş, Ya. (Candidate of physico-mathematical sciences)

ORG: none

TITLE: Beams of light carrying information

SOURCE: Nauka i tekhnika, no. 11, 1966, 5-8

TOPIC TAGS: laser communication, laser beam

SUB CODE: 17,20

ABSTRACT: The ever-expanding need for exchange of information has crowded the radio frequency spectrum. A qualitatively new solution to the problem of channel capacity is offered by the recently created sources of monochromatic coherent light. These so-called masers and lasers operate at extremely high frequencies, and, since the quantity of information theoretically able to be transmitted on a communications channel is directly proportional to the frequency, their theoretical information capacity is tremendous. The capacity of a laser communications channel is at least 1000 times greater than the capacity of all radio channels used up to now, including microwave. This means that if we use 1% of the carrier frequency for message transmission, a laser beam operating at  $3 \cdot 10^{14}$  Hz could carry approximately 1 billion telephone conversations or several thousand television channels simultaneously. Due to the coherent nature of the beam and the lack of dissipation, a low power (several dozen watts) laser installation can maintain communications in outer space over ranges of hundreds of millions of kilometers. The primary problem hindering laser communications now is modulation of the laser beam. Theoretically, any of the four standard

Card 1/2

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ACC NR: AP7009580

parameters of a laser beam can be modulated to place information on the beam: frequency, amplitude, phase and polarization. Actually, two primary methods can be used to modulate the light beam exiting from a laser: internal and external methods. In the first case, the light beam is acted upon as it is being formed, i.e., within the actual laser. In the second case, the modulation is performed after the beam has been created. Internal methods include regeneration modulation, modulation using the Stark effect and modulation using the Seeman effect. Scientists at present are giving preference to the external modulation methods, which include modulation of the pumping, mechanical modulation, modulation using the Faraday effect, modulation using the Kerr effect and modulation using the optical birefringence effect in piezoelectric crystals. This last effect, especially strongly appearing in potassium dihydrophosphate and ammonium dihydrophosphate crystals, is currently considered to be the most promising. Orig. art. has: 4 figures. [JPRS: 40,102]

Card 2/2

EYDUS, Ya.A. [Eiduss, J.]; VENTER, K.K.; GILLER, S.A., akademik

Effect of terminal substituents in 5-nitrofurylpolyene derivatives  
on their electron spectra. Dokl. AN SSSR 141 no.3:655-658 N '61.  
(MIRA 14:11)

1. Institut organicheskogo sinteza AN Latvyskoy  
SSR i Latvyskiy gosudarstvennyy universitet im. P. Stuchki.
2. AN Latvyskoy SSR (for Giller).  
(Olefins--Spectra)

SILIN'SH, E.A. [Silins, E.]; POPENS, YA.YA. [Popens, J.]; EYDUS, Ya.A.  
[Edius, J.]

Spectrophotometric and fluorimetric determination of corticosteroid hormones. Izv. AN SSSR.Ser.fiz. 26 no.10:1311-1313 '62. (MIRA 15:10)

1. Latviyskiy gosudarstvennyy universitet im. Petra Stuchki i  
Respublikanskaya klinicheskaya bol'nitsa im. Paulya Stradynya.  
(HORMONES) (SPECTROPHOTOMETRY) (FLUORIMETRY)



S/197/63/000/002/004/005  
B117/B186

AUTHORS: Eydus, Ya., Polko, T., Yur'yev, Yu.

TITLE: Vibrational and electronic spectra of certain selenophene homologues

PERIODICAL: Akademiya nauk Latvyskoy SSR. Izvestiya, no. 2 (187), 1963, 63-67

TEXT: Vibrational and electron spectra of trimethyl, tetramethyl, 2-ethyl, 2-propyl and 2-butylselenophene were examined and compared with previously investigated spectra of mono and dialkyl selenophenes. The following particularities were established: The band  $3060\text{ cm}^{-1}$ , which corresponds to the C-H vibrations and is intensive in the infrared spectrum of the selenophene, is slightly shifted toward lower frequencies. It is intensive in Raman spectra but, unlike selenophene, it is very weak in infrared spectra. Since the intensive band observed between  $2950$  and  $2960\text{ cm}^{-1}$  is absent from the spectrum of the very symmetric tetramethylselenophene it seems to be characteristic for such selenophenes as are substituted by mono-, di-, and trialkyl. Unlike tri- and

Card 1/2

Vibrational and electronic spectra of ...

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B117/B186

tetramethylselenophenes, in whose spectrum the band  $2750\text{ cm}^{-1}$  is very weak, it became intensified in the spectra of mono- and dimethylselenophene as the number of methyl groups increased. The bands corresponding to the  $\text{C}\equiv\text{C}$  vibrations were ascertained in the same region as in the spectra of alkyl derivatives of selenophene previously investigated.

The band in the region  $700\text{ cm}^{-1}$  is characteristic for the vibrations of the C-Se bonding and likewise agrees with previous results. The band in the region  $1380\text{ cm}^{-1}$ , established in all the compounds investigated, may be attributed to deformation vibrations of the C-H bonding. On comparing the vibrational spectra examined with data hitherto available on spectra of alkanes, cyclic and aromatic hydrocarbons it was found that cyclic compounds that are substituted by propyl can be identified from their vibrational spectra with sufficient reliability. In investigating the electron spectra of alkyl selenophenes it was found that they have an absorption maximum in the region  $250\text{ m}\mu$  but fail to exhibit any other particularity. There are 5 figures and 1 table.

SUBMITTED: September 1, 1962

Card 2/2

ACCESSION NR: AP4020955

S/0051/64/016/003/0424/0428

AUTHOR: Bobovich, Ya.S.; Eydus, Ya.A.

TITLE: Quantitative measurements of intensity in the Raman spectra of powdered substances

SOURCE: Optika i spektroskopiya, v.16, no.3, 1964, 424-428

TOPIC TAGS: Raman spectroscopy of solids, powder Raman spectra, naphthalene, furan, nitrofurane, paranitrophenetole, diphenylamine, paranitrotoluene, stilbene, tolan, diphenylacetylene

ABSTRACT: It is difficult or impossible to obtain Raman spectra by the conventional procedure in the case of poorly soluble substances and substances that undergo photochemical reactions in solution. In principle the problem of obtaining the Raman spectra of such substances in powdered form has been solved; the operation involves the use of powerful mercury tubes and a double monochromator (B.A.Kiselev, Opt. i spektr. 1, 597, 1956; S.L.Berkovich et al, Ibid. 6, 824, 1959; Ya.S.Bobovich and V. M. Pivovarov, ZhETF 29, 696, 1955). In the present article there is described a specific technique for measuring the intensity coefficients of the Raman lines in the

Card 1/32

ACCESSION NR: AP4020955

spectra of fine-crystalline organic powders as well as some applications of the technique. The analyzed substance is mixed with naphthalene and thoroughly ground; the mixture is coated on an oblique cut surface of a wooden cylinder. The exciting radiation is supplied by a helical low-pressure mercury discharge tube and the scattered radiation is viewed, as usual, from the side. The naphthalene serves as the internal standard, i.e., the Raman line intensities are gaged with reference to the intensity of the  $1380\text{ cm}^{-1}$  naphthalene line. It is noted that an essential requirement in the case of colored substances is that the exciting radiation must be of appropriate frequency, i.e., must penetrate into the substance + naphthalene layer. The results of test measurements on a number of substances insoluble and soluble are described; among the insoluble substances were some nitrofurans and para-nitrophenetole (the intensity increases in direct proportion to the molar concentration in the mixture with naphthalene). For the soluble substances the intensity values obtained for the powders and for solutions agree in some cases, but differ significantly in others (but the relative values for different substances are consistent). Thus, the proposed technique makes it possible to obtain the Raman spectra of many substances that cannot be worked with in the form of solutions. Orig.art.has: 2 figures and 2 tables.

Card 2/32

L 62302-65 EWT(1)/EWT(m)/EPF(c)/EWP(j)/T/EWA(c) IJP(c) RM

ACCESSION NR: AP5019982

UR/0371/65/000/002/0075/0082

16  
15  
B

AUTHOR: Eiduss, J. (Eyduş, Ya. A); Zuika, I. (Zuyka, I. V.)

TITLE: Band intensities in Raman spectra<sup>21</sup> of crystalline powders of 5-nitrofurans and the intramolecular interaction

SOURCE: AN LatSSR. Izvestiya. Seriya fizicheskikh i tekhnicheskikh nauk, no. 2, 1965, 75-82

TOPIC TAGS: Raman spectrum, nitrofurans, conjugated bond<sup>7</sup> system, nitrofurans vinyllog

ABSTRACT: The authors obtained Raman spectra and determined the band intensity coefficients for a series of nitrofurans and their vinyllogs. A method involving the use of an internal standard (nephthalene) was used. It consisted in thoroughly mixing the substance studied in the form of a crystalline powder with the powdered internal standard in various molar ratios and recording the spectrum with a DFS-12 diffraction spectrometer. It was found that in the crystalline state, certain nitrofurans and their first vinyllogs are sufficiently stable when illuminated with the 4360 Å line of mercury, so that the measurements could be carried out. The band intensity of the nitro group in

Card 1/2

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ACCESSION NR: AP5019982

the region of  $1350\text{ cm}^{-1}$  is discussed; while the frequency of the nitro group varies little upon the introduction of the vinylidene group into the 2-substituting chain (by no more than  $10\text{ cm}^{-1}$ ), the intensity varies by a whole order of magnitude and even more (by a factor of 20-40). This increase in the intensity of the vibrational band of the substituent, located in the para position relative to the additional conjugation element introduced, indicates beyond any doubt that the nitro group, ring, and X-substituent are integral parts of a single conjugated electronic system. This may be regarded as sufficient evidence in favor of the interpretation of electronic bands which treats the latter as the result of the first and second electronic transition, and not as transitions of two isolated electronic systems ("separated chromophores").  
Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Latvyskiy gosudarstvennyy universitet im. P. Stuchki (Latvian State University)

SUBMITTED: 10Dec64

ENCL: 00

SUB CODE: OC,OP

NO REF SOV: 012

OTHER: 000

Card 2/2 *jk*

CHIPEN, G.I.; ~~EYDUS, Ya.A.~~ [Eidus, J.]; BOBOVICH, Ya.S.; GRINSHTEYN, V.Ya.  
[Grinsteins, V.]

Structure of N-acyl derivatives of  
3-phenyl-5-amino-1,2,4-triazole. Zhur.  
strukt.khim. 6 no.1:53-57 Ja-F '65. (MIRA 18:12)

1. Institut organicheskogo sinteza AN Latviyskoy SSR;  
Latviyskiy gosudarstvennyy universitet imeni P.Stuchki i  
Gosudarstvennyy opticheskiy institut imeni S.I.Vavilova.  
Submitted October 10, 1963.

18

CA

THE FORMATION OF NITROGEN DIOXIDE FROM NITROGEN AND OXYGEN IN A HIGH-FREQUENCY DISCHARGE. A. A. Balandin, Ya. T. Eldus, N. Soloviy and V. Vernikovskiy. *Usp. Khim.* 1956, 25, 213-18 (1956); *Chem. Abstr.* 1956, 50, 10322.  $\text{NO}_2$  is formed in a mixt. of  $\text{O}_2$  and  $\text{N}_2$  under the influence of the high-frequency discharge. In expts. in a closed system without circulation of the gases it was shown that, following a break in pressure, a gradual decrease in it takes place; after 1.5 hrs. under the given exptl. conditions the pressure begins to increase, with the simultaneous formation of brown  $\text{NO}_2$  vapors. In a closed system, with circulation of the gas, the  $\text{NO}_2$  was frozen out and identified by its m. p. The velocity of formation of  $\text{NO}_2$  from a stoichiometric mixt. of  $\text{N}_2$  and  $\text{O}_2$  is about 6 times as great as from air. M. G. Moore

ASB-514 METALLURGICAL LITERATURE CLASSIFICATION

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SECTION 7: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

SECTION 8: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

SECTION 9: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

SECTION 10: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



SA		753	
<p>837. Formation of Butadiene and Acetylene by H.F. Discharges on Ethylene. A. Belandin, J. Eides and N. Zolgin. <i>Comptes Rendus de l'Acad. des Sciences, U.S.S.R.</i> 4, pp. 132-137, Oct. 31, 1954. In German.—In a closed system, ethylene containing a little hydrogen is completely condensed after 10 hours by the action of h.f. discharges, the gaseous phase containing 67 % hydrogen and 30 % of saturated hydrocarbons (5.3 % methane), and the condensation product being a dark oily liquid of molecular weight about 800. Acetylene was not detected, since it takes part in the reaction. An induction period was observed which is shortened by the presence of water-vapour. In a circulating system at atmospheric pressure, a volume contraction was observed which altered almost linearly with time, and butadiene together with maleic anhydride were formed, the former in amounts dependent on the circulation velocity and partial pressure of hydrogen in the exit gas. The results indicate a chain mechanism for the reactions.</p>			
H. H. Ho.			
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION			
GROUP 1		GROUP 2	
GROUP 3		GROUP 4	

10  
 The influence of the conditions of formamide nitration on the yield and proportion of isomeric nitroformamides. V. T. Blus, A. P. Alekhina and M. V. Aristarkhova. *Aminobenzonitrils* *Proc.* 4, 362-8 (1934); cf. C. A. 28, 7803. The influence of chem. and phys. factors on the process of nitration of PhNHCHO and the yields of  $p$ -O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NHCHO (I) and  $o$ -O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NHCHO (II) was investigated. To 240 g. of 99.8% H<sub>2</sub>SO<sub>4</sub> was slowly added 61 g. (0.6 mol.) PhNHCHO, m. 47°, at 4° and then 46.1 g. (0.8% excess) of 68.0% HNO<sub>3</sub> at 0°, the mixt. was allowed to stand 30 min. and poured into 300 g. ice and 600 cc. H<sub>2</sub>O, filtered and washed with ice-cold H<sub>2</sub>O; 80% I and 10.0% II were obtained and 2.2% of I and II was in the filtrate. By substituting 95 and 90% H<sub>2</sub>SO<sub>4</sub>, without changing the abs. acidity, the yield of I was decreased and

that of II increased with traces of PhNH<sub>2</sub> in the filter cake and some PhNH<sub>2</sub> in the filtrate; with 6% fuming H<sub>2</sub>SO<sub>4</sub> the yields dropped to 31.9% I and 0.85% II with 50.5% amines in the filtrate and 7.5% of 2,4-H<sub>2</sub>NC<sub>6</sub>H<sub>3</sub>(NO<sub>2</sub>)<sub>2</sub> in the filter cake. With twice the amt. of H<sub>2</sub>SO<sub>4</sub> (99.8%) the yield of I was practically unchanged, while that of II was reduced by washing to 4% with 20% of mixed amines in the filtrate. The product gave dyes nearly equal to the standard. By 50% reduction of H<sub>2</sub>SO<sub>4</sub>, the nitration was incomplete with a considerable decrease in the yield of I and increase in that of II. An excess of 10 and 50% of HNO<sub>3</sub> showed no marked effect on the results of nitration, while deficiency of 10% HNO<sub>3</sub> of theory caused incomplete nitration with the yields of I decreased and II increased. At -10° the nitration was incomplete with the proportion of I and II practically unchanged, viz. 73.7% I and 8.1% II, and 3.6% of I, II and PhNH<sub>2</sub> in the filtrate, while at higher temps. the proportion of I and II was altered, viz. at 5° 68.3% I and 10.0% II with 2.1% of I and II in the filtrate, and at 15° 61.2% I and 10.8% II with 3.4% of I and II in the filtrate. Chas. Blanc

ASR-51A METALLURGICAL LITERATURE CLASSIFICATION

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 701

CH

Chemical effects of high-frequency electric discharge on a nitrogen-oxygen mixture. A. A. Balandin, Ya. I. Eidus and N. G. Zalogin. *J. Phys. Chem.* (U. S. S. R.) **67**, 3017-3020 (1963). — The formation of oxides of N in O-N mixts. subjected to a high-frequency elec. discharge takes place by a chain mechanism. The primary products are ozone and  $\text{NO}_x$ , the latter then decoupe into  $\text{NO}$  and  $\text{O}_3$ . The energy input for 1 kg.  $\text{HNO}_3$  is 370 kw-hrs. and the efficiency of the elec. discharge is 0.025%.

Zelkov

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND POSITIONS												3RD AND 4TH POSITIONS											
PROCESSES AND PROPERTIES INDEX																							
<p><b>BC</b></p> <p>Chemical reactions between nitrogen and oxygen in a high-frequency discharge. A. A. BALANOV, J. T. ERDUT, and N. G. KALOSIN (Acta Physicochim. U.R.S.S. 1968, 4, 285-304).—Under the influence of a high-frequency discharge, mixtures of <math>N_2</math> and <math>O_2</math> yield at first <math>O_3</math> and <math>N_2O_3</math>, the <math>O_3</math> being subsequently decomposed. When the velocity of decomp. of <math>O_3</math> has reached a max. val. <math>N_2O_3</math> decomposes into <math>NO_2</math>. The <math>N_2O_3</math> is supposed to catalyze the decomp. of <math>O_3</math> by decomposing into <math>NO_2</math> and <math>O_2</math>. <math>NO_2</math> reacts with <math>O_3</math> to form <math>NO_3</math>, which combines with <math>NO</math> to re-form <math>N_2O_3</math>. C. R. H.</p>																							
<p>ASB-51A METALLURGICAL LITERATURE CLASSIFICATION</p>																							
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*BC*

*a-1*

**Free atoms and molecular dissociation in high frequency discharges.** A. A. BALANDIN and J. KIPUS (*Aeta Physicochim. U.R.S.S.*, 1936, 4, 837-840).—The instantaneous pressure increase on starting a high-frequency discharge was studied for discharges through a no. of pure and mixed bimol. gases and Ne. The effect, observed with all bimol. gases, is dependent on the nature of the electrodes, the initial pressure of the gas, and the current and voltage in the secondary. No effect is observed with Ne. The presence of H atoms in the discharge through  $H_2$  is indicated by the reduction of  $MnO_2$  in the discharge tube.

O. D. S.

ca

4

Chemical effect of high frequency corona discharge on ethylene. *Vys. i. fiz. Bull. Acad. Sci. U. S. S. R., Classe sci. math. nat. St. chim.* 1938, 737-81. A study of the effect of high-frequency corona discharge on  $C_2H_4$  in flow, circulation and static systems shows that in the flow system at a rate of flow of 45 cc. min. and in the static system far-reaching polymerization of  $C_2H_4$  takes place with formation of an oily liquid of mol. wt. 450-500 and a semi-solid substance. This is accompanied by cracking of  $C_2H_4$  to H and C. In the flow and circulation systems at a rate of flow of the gas of 100-1000 cc./min. a liquid condensate was obtained. Its fraction b. 0-15° contained up to 3% butadiene (based on the reacted  $C_2H_4$ ). The amt. of butadiene formed increases with increase of the duration of the reaction. In the gaseous phase marked amts. of  $C_2H_2$  and H as well as satd. hydrocarbons are formed. Formation of  $CH_4$  indicates splitting of the C—C bonds. Indications were obtained that  $C_2H_2$  is an intermediate product in the reactions of  $C_2H_4$ . The reactions of  $C_2H_2$  in the discharge are thought to follow the chain mechanism. The mechanisms of formation of  $C_2H_2$  and butadiene are outlined. J. G. Tolpin

ASAC-31A METALLURGICAL LITERATURE CLASSIFICATION

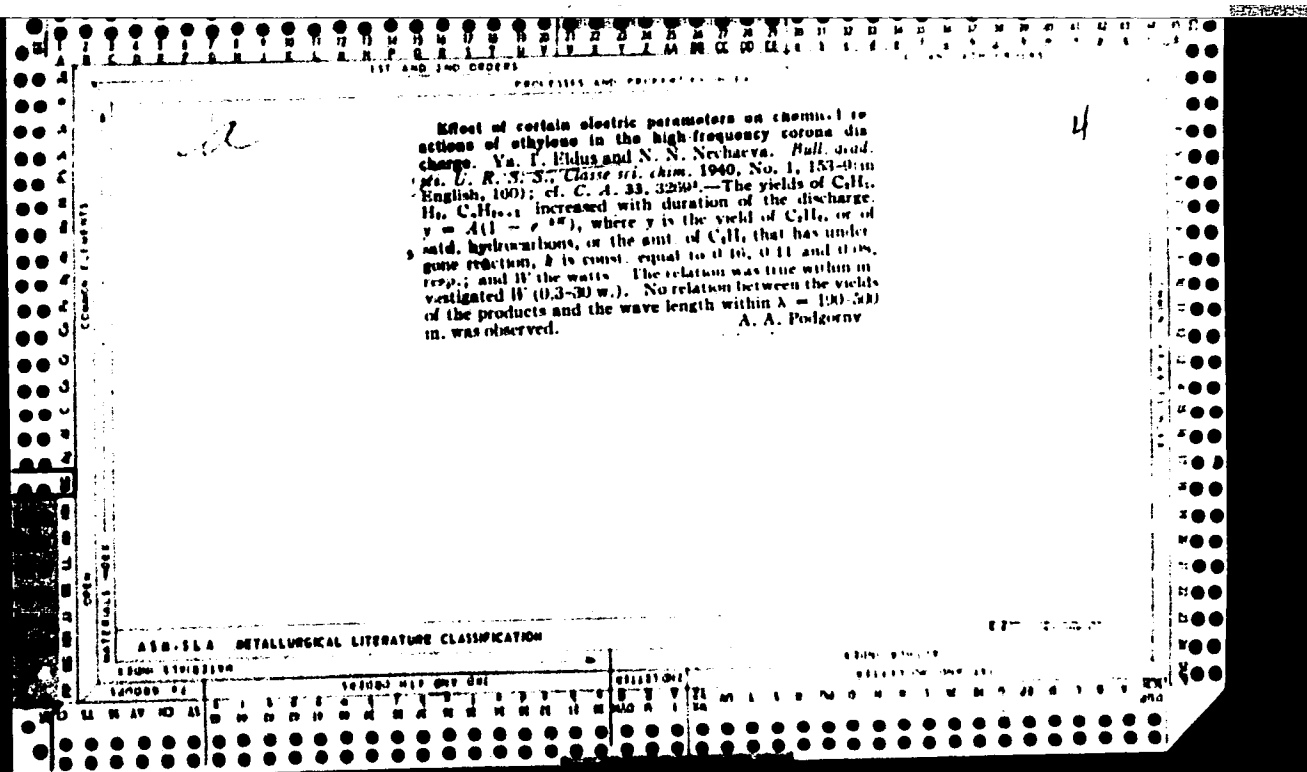
1ST AND 2ND SERIES		3RD AND 4TH SERIES	
PROCESSING AND PROPERTY INFO			
<p>BC</p> <p style="text-align: right;">A.1</p> <p>Chemical action of high-frequency corona discharge on ethyl alcohol vapour. J. T. Kline (Bull. Acad. Sci. U.S.S.R., 1938, No. 1167-1173).—At low pressure or with A at 1 atm. dehydrogenation is the primary reaction caused by high-frequency corona discharge on EtOH vapour. MeCHO formed is then decomposed to CO and <math>\text{CH}_4</math>. F. H.</p>			
ASD-LLA METALLURGICAL LITERATURE CLASSIFICATION			
EDOM SYMBOLS		FROM SYMBOL	
SYMBOLS		SYMBOLS	
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	



1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
ca										10									
<p>Mechanism of the synthesis of aliphatic hydrocarbons by the contact hydrogenation of carbon monoxide. Ya. T. Eldus. <i>Uspehi Khim.</i> 9, 673-81 (1940); cf. 1942, 7, 1714, 1801 (1948).—E. considers in particular the carbide theory in connection with Co catalysts and cites photochem. data on the nature of the CO bonds. Cf. previous papers by Fischer and Tropsch, <i>C. A.</i> 22, 497; P. and Fichler, <i>C. A.</i> 33, 9006; Crazford, <i>C. A.</i> 33, 9000; F. H. Rathmann</p>																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
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PERMANENT AND PROPERTIES																									
<p>10</p> <p>Analysis of acetylene-ethylene gas mixtures. Ya. F. Eidus. <i>Zavodskaya Lab.</i> 8, 948-50 (1989).— The <math>C_2H_2</math> in <math>C_2H_2 + C_2H_4</math> mixts. was detd. by absorbing the <math>C_2H_2</math> in a Hempel tube contg. over 100 ml. of a soln. contg. 20 g. <math>Hg(CN)_2</math> in 100 ml. of 2 N NaOH. Absorption of <math>C_2H_2</math> was practically complete after 3 min. shaking while the vol. loss of <math>C_2H_4</math> was 1.8%. The absorption of the <math>C_2H_2</math> was 2.5-3 times slower than in an ammoniacal 2% soln. of <math>AgNO_3</math>. Dilm. of the <math>C_2H_2</math> with air or with an inert gas decreased the absorption of <math>C_2H_2</math> during a 3-min. period. B. Z. Kamich</p>																									
<p>7</p>																									
<p>ASS. S. L. A. METALLURGICAL LITERATURE CLASSIFICATION</p>																									

1ST AND 2ND ORDER		PROCESSING AND PROPERTIES UNIT		3RD AND 4TH ORDER																																																																																																					
Ca		<p>Detection of nitrotoluene in nitrobenzene and of toluene in benzene. I. H. Ya-T-Hsueh and T. L. Pedichkina. <i>Bull. acad. sci. U. R. S. S., Classe sci. chim.</i> 1940, 275-81, 282-7. The method used by Raikow and Urkewitch (<i>Chem. Ztg.</i> 30, 205 (1906)) for the detection of toluene (I) in benzene (II) is based on the assumption that the mixt. of I and II gives on nitration a mixt. of nitrotoluene (III) and nitrobenzene (IV) in which III can be detected since it supposedly gives at ordinary temp. a yellow-brown compd. with pulverized NaOH whereas IV does not react under these conditions. It is shown now, however, that this method is erroneous because neither IV nor any of the 3 isomeric nitrotoluenes gives an immediate yellow-brown coloration with solid NaOH. The color observed by R. and U. is due to the product formed from 1,3-dinitrobenzene (V) and solid NaOH, V being always found among the nitration products of II. A method which allows the detn. of I in II in amts. as low as 0.1% has been developed which is based on the different color reactions given by III, IV and V with solid KOH and petr. ether. Thus a mixt. contg. III, IV, and V gives 3 distinct colored zones with KOH which appear with different velocities.</p> <p>Gertrude Herend</p>		7																																																																																																					
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION																																																																																																									
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td> </tr> </table>						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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10

CA

Processes and Properties Index

Intermediate formation of methylene radicals during the catalytic synthesis of aliphatic hydrocarbons from carbon monoxide and hydrogen. Ya. T. Eklus and N. D. Zelinskii. *Bull. acad. sci. U. R. S. S., Chem. ser.* 1960, 201-203. —A very highly purified mixt. of CO and H<sub>2</sub> was allowed to react over a Ni-Co-Al catalyst in the presence of C<sub>6</sub>H<sub>6</sub> (I) at 180° whereby small quantities of toluene (II) and xylene (I) were formed [detected as nitrotoluene and nitroxylene (I), resp.]. The formation of II was explained through the action upon I of methylene radicals intermediately formed during the contact hydrogenation of CO.

Gertrude Herend

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

EIDUS, IA. T.

RT-1420(The mechanism of the synthesis of aliphatic hydrocarbons by the contact  
hydrogenation of carbon monoxide)

SO: Uspekhi Khimii,9(6): 673-681, 1940 (Original Russian source unavailable for review)

CA

Formation of 1,3-butadiene, chloroprene and acetaldehyde by the action of high-frequency electric discharge on acetylene and its mixtures with other substances. A. A. Balandin, Ya. I. Babin and R. M. Terent'eva. *Chem. Abstr.* 1940, 34: 273343 (1940) (in English) *trans. and abstr.* R. S. S. 273343 (1940) (in English)

The reactions of  $C_2H_2$  (I) and its mixts. with H,  $C_2H_4$  and  $HCl$  in elec. discharges of high frequency were studied both in circulatory and static systems. The amt. of I converted to butadiene depended on various factors such as the diam. of the tube and electrode, kind of electrode and duration of expt., etc. Metal electrodes catalyze the reaction. The introduction of H or a compl. splitting off  $H_2$ , e. g.,  $C_2H_4$ , promotes the reaction. Chloroprene and  $AcH$  were detected in the products when  $HCl$  or  $H_2O$  was added to I and the reaction carried out.

J. C. Lo Chyao

No. 4

ASAC-31A METALLURGICAL LITERATURE CLASSIFICATION

EYDUS, Ya. T., KAZANSKIY, B. A. and ZELINSKIY, N. D.

"The Influence of the Type of Carrier on the Synthesis of Liquid Hydrocarbons  
Over Ni-MnO-Al<sub>2</sub>O<sub>3</sub> Catalysts at Atmospheric Pressure," Iz. Ak. Nauk SSSR, Otdel Tekh  
Nauk, pp 27-33, 1941



[illegible]

PROCESSING AND PROPERTIES INDEX																									
21																									
Ca																									
<p>Carbide formation as an intermediate stage in the catalytic synthesis of hydrocarbons from water gas. Ya. I. Eidel and N. D. Zelinskii. <i>Bull. acad. sci. U.R.S.S., Classe sci. chim.</i> 1942, 100-4 (English summary). The Co carbide formed by the action of CO on the Co-TiO<sub>2</sub>-Kieselguhr catalyst is neither an intermediate product nor a catalyst of the synthesis of gasoline from CO and H<sub>2</sub>. Intermediate formation of methylene radicals during this synthesis appears to be confirmed. G. M. K.</p>																									
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DETAILS OF LITERATURE CLASSIFICATION																									

1ST AND 2ND PAPERS		PROCESSED AND PROPERTIES INDEX		100 AND 4TH COPIES	
CA		21		No. 1	
<p>The reactions of some O-containing organic compounds over the cobalt contact catalysts used for the synthesis of gasoline from water gas. Ya. T. Eklus. <i>Bull. acad. sci. U. R. S. S., Classe sci. chim.</i> 1943, 65-73 (English summary).—MeOH decomps. almost completely over a <math>\text{Co}(\text{H}_2\text{O})_2</math>-kieselguhr catalyst at 170–200° forming CO and H<sub>2</sub>. These react further to form a mixt. of liquid hydrocarbons, similar in properties to, but smaller in amt. than, the mixt. obtained directly from water gas over this catalyst. <math>\text{HCO}_2\text{H}</math> similarly decomps., chiefly to H and CO<sub>2</sub>, some what less to H<sub>2</sub>O and CO, and very slightly to <math>\text{HClH}_2</math>, C<sub>2</sub>H<sub>4</sub> and H<sub>2</sub>O. EtOH gives a series of products, of which the chief are CH<sub>4</sub>, CO and H<sub>2</sub>. In both cases, liquid hydrocarbons are formed, but always as secondary products from CO and H<sub>2</sub>. Thus, MeOH, <math>\text{HCO}_2\text{H}</math> and EtOH cannot be intermediates in the synthesis of hydrocarbons from water gas. H. M. Leicester</p>					
<p>ASM. 51.4 METALLURGICAL LITERATURE CLASSIFICATION</p>					
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1st AND 2nd EDITIONS		PROCESSES AND PROPERTIES INDEX		1st AND 2nd EDITIONS	
C A		<p>Activating effect of certain metal oxides on Fe-Cu catalysts, used in the synthesis of gasoline from water gas. Ya. T. Eldes, P. F. Epifanov, L. V. Petrova, N. V. Kargin and S. B. Al'tshuler. <i>Bull. acad. sci. U. R. S. S., Classe sci. chim.</i> 1943, 145-51 (English summary). — Of the oxides of Mg, Al, Mn and Th, the first 2 had the highest activating effect on Fe-Cu-K<sub>2</sub>CO<sub>3</sub>-kieselguhr catalysts prepd. by the pptn. method and used in the synthesis of gasoline from water gas. The highest yield of liquid hydrocarbons was obtained with a catalyst prepd. by pptn. with K<sub>2</sub>CO<sub>3</sub> and activated with MnO. The catalytic stability of the Fe-Cu catalysts was low. O. Berend</p>		21	
No. 2					
<p>ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>					

1ST AND 2ND EDITIONS																				MO AND ITH CODE(S)																			
PROCESSES AND PROPERTIES INDEX																																							
<div style="float: left; width: 10%;">CA</div> <div style="float: right; width: 10%; font-size: 2em;">18</div> <div style="clear: both;"></div> <p>No. 4 Activity and stability of Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub> catalyst in the synthesis of liquid hydrocarbons from CO-H mixture as influenced by composition of the catalyst and the nature of the carrier. Ya. T. Khlas and N. V. Klagina. <i>Bull. acad. sci. U. R. S. S., Classe sci. chim.</i> 1963, 205-11(English summary).--Eighteen catalysts of compn. Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub>, carrier were examd. in the synthesis of liquid hydrocarbons from 1:1 CO-H<sub>2</sub> mixt. The catalyst Fe 100: Cu 25: K<sub>2</sub>CO<sub>3</sub> 2: kieselguhr 125 shows a sharp optimum for ThO<sub>2</sub> content at 1%. Slight max. in efficiency is found at 2% K<sub>2</sub>CO<sub>3</sub> in Fe 100: Cu 25: ThO<sub>2</sub> 2-kieselguhr catalyst. In this catalyst, the best results were obtained with the carrier of Isen diatomite and marshallite, with the latter support being somewhat more stable. The results contradict the view of catalyst support as an inert mass. The Fe catalyst investigated showed poor stability, which was not improved with variations of ThO<sub>2</sub> content. G. M. Komolapoff</p>																																							
ASD-SL6 METALLURGICAL LITERATURE CLASSIFICATION																				ENTRIES NAME																			
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C	S	A	N	V	M	D	I	E		T	H	R	G	O	L	F		P			J	A	M		A	I	I	C	O	N	T	M	E	A	C	V	E	N	

**CHEMICAL INTERACTION OF CO WITH Mg ORGANIC COMPOUNDS AND POLYMERIZATION**

Chemical interaction of CO with Mg organic compounds.  
Ya. T. Fildes. Bull. acad. sci. U.R.S.S., Classe sci. chim. 1964, 783-78 (English summary).—A math.-theoretical discussion of the reaction of CO with Grignard reagents. All possible complex are considered and the existence of a new isomeric type-operator isomerism is shown. The formation possibilities are shown by means of chemioformal analysis. Some 50 compds. are shown to be possible in operators. Some 50 compds. are shown to be possible in operators. Some 50 compds. are shown to be possible in operators.

G. M. Kozlovskii  
**Secondary reactions in the ozonization of ethylene**  
Hakuge. M. Sindt and A. Mouré. Riv. Chim. Acta 37, 650-61(1944) (in French).—Riche, et al. (C.A. 37, 5064) have indicated that the ozonation of an ethylenic compound may proceed by formation of both monomeric and polymeric oxides, decompose to give abundant acids, and polymetric oxides, decompose to yield abnormal products of a mixt. of CH<sub>2</sub>, H<sub>2</sub>O, CO and C atoms less than the cleavage products with 1 or more C atoms less than the normal oxidation products. S. and R. (C.A. 31, 6192) also found that, in prep., aldehyde acids by the catalytic reduction of osones, only 70% reduction was observed, together with formation of 15-35% of neutral compounds, either non-aldehydic or said. The reduction of the osone from Et oleate (I) gave mixture suggesting abnormalities from the normal action but since it was not possible to isolate the fractions readily, the similar treatment of 30 g. brass-compd. was undertaken. The ozonation of 30 g. brass-compd. (II), b.p. -9.9-9.5°, d<sub>4</sub><sup>20</sup> 0.8543, in EtOAc alkyl acetate (III), b.p. -29.0-9.5°, d<sub>4</sub><sup>20</sup> 0.8543, in EtOAc at -15°, followed by a 68% catalytic reduction in the presence of Pd gave 2.4 g. acid and 19.2 g. neutral fraction. Distn. of the neutral portion proceeded with evolution of gas, mostly CO, and yielded, in addition to the normal aldehyde fractions, 2.5 g. of an intermediate fraction, by hydrolysis consisting of polarographic acid (IV) and lauryl acetate (V). In another expt. this distn. also gave 13-acetyltriidecanic acid (VI). An analogous reduction of acetoxytriidecanic acid (VII). An analogous reduction of acetoxytriidecanic acid (VIII). An analogous reduction of acetoxytriidecanic acid (IX).

b.p. 108-9°; m. 2-8°. d<sub>4</sub><sup>20</sup> 0.8504 in EtOAc at -15°, gave 19.2 g. of neutral product and 3.4 g. of a mixt. of III and V. The neutral product was treated with NaHSO<sub>3</sub>. and the NaHSO<sub>3</sub> complex was sepd. from the 3.7 g. of nonaldehydic product consisting of 22% of Et triacetate (Va) (XIIIa), 6-7%, IV, 30% Et 13-octadecanoate (XIc) and 22% of behenyl acetate (VII). Decompn. of the NaHSO<sub>3</sub> complex produced 4.5 g. octanol (VIII), b.p. 78-87°, d<sub>4</sub><sup>20</sup> 0.8294, and 7.3 g. tridecan-1-ol-12-al acetate, b.p. 126-30°, n. D<sub>D</sub><sup>20</sup> 1.4075, d<sub>4</sub><sup>20</sup> 0.9274. These findings support the contention of R. and an equation is given to account for the formation of III, IV, VIII, V and the corresponding aldehyde, the hydrocarbon C<sub>18</sub>H<sub>38</sub>, as well as CO and CO<sub>2</sub>; by the decompn. of the polymerized osone I of II and VI. The same decompn. of the osone of I gave similar products except that Et caprylate was formed instead of IV. IV can only be formed by an abnormal decomposition of the osone and a stepwise degradation of the chain. Accordingly, the use of ozonolysis as a quant. method for the detn. of the position of a double bond is open to question owing to difficulties of interpretation. The formation of III and Va when the ozonation is carried out in the presence of EtOAc, which is also accompanied by an abnormal wt. of crude oxide and an increased value of the saponification index of the different reaction products, is explained by supposing that the EtOAc participates in the action of the osone. C. R. A.

1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
PROCESSES AND PROPERTIES INDEX																			
<p>ca</p> <p style="text-align: right;">21</p> <p style="text-align: right;">No. 4</p> <p>Catalysts for hydrogenation of CO by joint application of the dynamic and static methods. I. Activity of the complex Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub> kieselguhr catalyst. Ya. T. Kaban. <i>Dokl. akad. sci. U.R.S.S., Classe sci. chim.</i> 1944, 148, 22 (English summary); cf. C.A. 38, 5648, and preceding abstr.—The reaction was studied in a current of gas and also, by rate of change of pressure, in a closed system. On Fe-type catalysts, in contrast to the Co-type catalysts, the intermediate step in the synthesis is the formation of carbides. G. M. Kosolapoff</p>																			
METALLURGICAL LITERATURE CLASSIFICATION										SUBJECT INDEX									
1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
<p>1ST AND 2ND COLUMNS</p>										<p>3RD AND 4TH COLUMNS</p>									

1ST AND 2ND ORDERS		PROCESSES AND PROPERTIES INDEX	
<p>ca</p> <p>Catalysts of CO hydrogenation, as studied by joint application of dynamic and static methods. II. Study of activity of catalysts composed of components of complex Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub>-NiO catalyst. Ya. T. Eklus. <i>Hull. akad. sci. U. R. S. S., Classe sci. chim.</i> 1966, 119-28 (English summary); cf. C.A. 30, 2101<sup>1</sup>.—Study of the activity of various components of the complex catalyst showed that Fe, Cu, and either ThO<sub>2</sub> or K<sub>2</sub>CO<sub>3</sub> must be present. Fe catalysts apparently lead to the carbide-formation intermediate stage of CO hydrogenation. The complex catalyst at 245-35° showed an activation energy of 28.7 cal./mol. G. M. Kosolapoff</p> <p>No. 5</p>		21	
ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION			
SECTION DIVISION		SECTION DIVISION	
GROUP		GROUP	
SUBGROUP		SUBGROUP	



117 400 100 000000

PROCESSING AND POLYMERIZATION INDEX

117 400 100 000000

COMMON ELEMENTS

**Reaction between CO and organomagnesium compounds. M. V. Shostakov and Ya. T. Shostakova. *Uspekhi Khim.* 5, 375-382 (1944).—Review with 26 references.**

G. M. Koshlapoff

COMMON VARIANTS INDEX

117 400 100 000000

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**ASB-11A METALLURGICAL LITERATURE CLASSIFICATION**

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*Br. ab.*

Catalysts for hydrogenation of carbon monoxide. III. Role of the alkaline activator in forming the surface of the Fe-O<sub>2</sub>-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub> bimetallic catalyst. J. T. Eldus (Bull. Acad. Sci. U.R.S.S. Cl. Sci. Chim., 1945, 62—70).—Tb<sup>3+</sup> composite catalyst Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub> (100:25:2:2:125) has no effect in catalyzing the hydrogenation of CO<sub>2</sub> at 255° by H<sub>2</sub>. Tests with various combinations of the components show that K<sub>2</sub>CO<sub>3</sub> causes interaction of CO<sub>2</sub> and catalyst surface; even traces present in "non-alkali-activated catalysts" migrate to the surface and after a time such catalysts show some activity. Presence of ThO<sub>2</sub> assists this migration, which results in formation of metal carbide and CO; the latter may be hydrogenated. R. To.

10

ca

Synthesis of olefin hydrocarbons from primary alkyl magnesium halides and carbon monoxide under pressure. Yan, T. Khlos, N. V. Klagins, and N. D. Zelinskii. *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1965, 672-674.---

The effect of changing the halide in 2 examples of Fischer and Stoffer's reaction (C.I. 27, 2111) between Grignard reagents and CO under pressure is studied. The substitution of BuMgBr and iso-AmMgCl for BuMgCl and iso-AmMgBr yields the same products, 4-nonene and 2,4-dimethyl-4-nonene, resp., but the yields are 25.4% and 51% instead of 51% and 53.0%, resp. B. A.

ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION

1st and 2nd sheets		3rd and 4th sheets	
CA		2	
<p>Investigation of the catalysts for hydrogenation of carbon monoxide by joint application of the dynamic and the static methods. III. Role of the nitrate activator in the formation of the surface of the Fe-Cu-ThO<sub>2</sub>-K<sub>2</sub>CO<sub>3</sub>-bismuthate catalyst. Ya. T. Etkin. <i>Bull. acad. sci. U.R.S.S., Class sci. chem.</i> 1968, No. 1, 62-70 (English summary); <i>ibid.</i>, C.A. 60, 2649. The activity of 5 catalysts, comprising the components of the complex catalyst, and their combinations was investigated. The data obtained show that the alk. activator K<sub>2</sub>CO<sub>3</sub> occupies a substantial portion of the contact surface, causes the interaction of CO with the catalytic surface at 250°, and plays an important part in the catalytic processes of carbide formation and hydrogenation of CO. G. Lebedeff</p>			
ASB-11A - METALLURGICAL LITERATURE CLASSIFICATION			
FROM SOURCE		FROM SOURCE	
SOURCE #1		SOURCE #2	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

1ST AND 2ND ORDER										3RD AND 4TH ORDER									
PROCESSING AND PROPERTIES INDEX																			
2																			
<p>Principle of conservation of the valence angle in the multiplet theory of catalysis. A. A. Balandin and Ya. T. Ildus (Acad. Sci. U.S.S.R.). <i>Compt. rend. acad. Sci. U.S.S.R.</i> 49, 656-7 (1945) (in English).—The stereo-factors in the formation of activated complexes on hydrogenation and dehydrogenation catalysts are considered. Recent data that strengthen the multiplet theory (C.A. 30, 4079) are reviewed, and applications to chemisorption, hydrogenation, and deuterium exchange are cited. It is proposed that the optimum internuclear distance in the crystal lattice of the active metal may be calcd. from the valence bonds and angles of the complex, and on this basis W, Mo, V, Cr, and Fe are suggested as catalysts for the hydrogenation of ethylene. The difference in hydrogenation activities of different planes of Ni crystals (cf. Twigg, C.A. 34, 6634) is offered as addnl. evidence for the theory.</p> <p style="text-align: right;">M. L. Nielsen</p>																			
No. 4																			
410.11A METALLURGICAL LITERATURE CLASSIFICATION																			
19000 SYNOPTIC										190000 NIP DIV 001									
190000 NIP DIV 001										190000 NIP DIV 001									

BC

Role of the principle of conservation of the valency angle in the multiplet theory of catalysis. A. A. Balandin and J. T. Eklus (Compt. rend. Acad. Sci. U.R.S.S., 1948, 28, 635-638).—It is shown that the principle of conservation of the valency angle is a highly important factor during the adsorption of a reacting mol. on a catalyst to form an intermediate multiplet complex, in every way similar to a double bond, except for instability in the direction of the reaction co-ordinates. Thus, internuclear distances of the catalyst must be related to the dimensions of the adsorbed mol. in order that there may be min. stress in the multiplet complex. Optimum internuclear distances may be calc. by applying the principle of conservation of the valency angle. The different activities of the (110) and (111) planes of Ni in catalysing the hydrogenation of alkenes confirm the result of a calculation of the optimum internuclear distance based on the above theory. H. R. C.

ASB 31A METALLURGICAL LITERATURE CLASSIFICATION

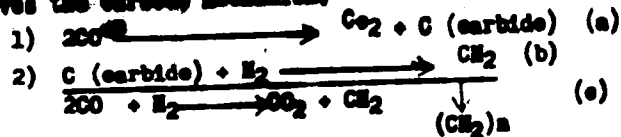
117 AND 210 SERIES		PROCESSING AND PROPERTIES INDEX		117 AND 210 SERIES	
<div style="position: absolute; top: 10px; left: 10px; font-size: 2em; font-family: cursive;">CH</div>		<div style="position: absolute; top: 10px; right: 10px; font-size: 2em;">2</div>		<div style="position: absolute; top: 10px; right: 10px; font-size: 1.5em;">No. 4</div>	
<p>Investigation of catalysts for the hydrogenation of carbon monoxide with joint application of the dynamic and the static methods. IV. Comparative study of the kinetics of carbide formation and the hydrogenation of carbon monoxide on cobalt, nickel and iron catalysts. Ya. T. Elina. <i>Izvest. Akad. Nauk, Otdel. Khim. Nauk</i> 1966: 977-98; <i>Chem. Zentr.</i> 1967, I, 1066; cf. C.A. 30, 4789. — The reactions taking place on Co-ThO<sub>3</sub> (100:18), Ni-Mn-Al<sub>2</sub>O<sub>3</sub> (100:20:10), and Fe-Cu-ThO<sub>3</sub>-K<sub>2</sub>CO<sub>3</sub> catalysts were studied. The catalysts were deposited on mordenite in a 1:1 ratio. From the kinetic data obtained at 200-300° with the Fe catalysts, it is inferred that the ratio of the rate of carbide formation to the rate of hydrogenation of the CO is that of the rate of the slowest of the series of reactions to the rate of the total reaction. This agrees with the carbide theory of the formation of hydrocarbons from CO-H<sub>2</sub> mixture. With the Co and Ni catalysts the hydrogenation reaction (3 CO + H<sub>2</sub> → CO<sub>2</sub> + CH<sub>4</sub> → (CH<sub>3</sub>)<sub>2</sub>) took place much faster than the carbide formation (3 CO → CO<sub>2</sub> + carbide C). This substantiated the earlier view of E. that the reaction mechanisms with the Co and Ni catalysts deviated from that with Fe catalysts.</p> <p style="text-align: right;">M. G. Moore</p>					
<div style="display: flex; justify-content: space-between;"> <span>ASB-51A METALLURGICAL LITERATURE CLASSIFICATION</span> <span>6-217-210-117</span> </div>					
FROM SYNDICATE		FROM SYNDICATE		FROM SYNDICATE	
100000 01		100000 01		100000 01	

4181. INVESTIGATION OF CATALYSTS FOR HYDROGENATION OF CARBON MONOXIDE BY SIMULTANEOUS APPLICATION OF THE DYNAMIC AND STATIC METHODS. IV. KINETICS OF CARBIDE FORMATION AND OF HYDROGENATION OF CARBON MONOXIDE ON COBALT, NICKEL, AND IRON CATALYSTS. Edus, Ya. T. (Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chim., 1946, 447-453; U.O.P. Surv. For. Petrol. Lit., Transl. 656, 1946, 7pp).

By the simultaneous application of the dynamic and static methods a comparative study was carried out of the kinetics of hydrogenation of CO and of the interaction of the latter with the surface of Co-Th-marshallite catalysts (100:18:100), of Ni-Th-Al-marshallite (100:29:10:100) and of Fe-Co-Th-K<sub>2</sub>CO<sub>3</sub>-marshallite (100:25:2:2:125). With the Co and Ni catalysts the reaction temps. were 180-210° with a gas mixt. 1 CO: 2 H<sub>2</sub> in the case of Fe catalyst 230-260° and 1 CO : 1 H<sub>2</sub>. The carbide formation and the hydrogenation of CO were studied at identical temps. in the same catalytic furnace. The kinetic data obtained show that the ratio of the initial velocities of hydrogenation of CO were studied at identical temps. in the same catalytic furnace. The kinetic data obtained show that the ratio of the initial velocities of



hydrogenation of CO to the carbide formation is much lower in the case of the Fe catalyst than for the Co and Ni catalysts. The lower ratio for the Fe catalyst results from the reduced hydrogenation velocity of CO on this catalyst as compared with the velocity of this process on the Co and Ni catalysts. This is in agreement with the carbide theory of synthesis of hydrocarbons from CO and H<sub>2</sub>. On Co and Ni catalysts the rate of hydrogenations of CO materially exceeds that of interconversion of CO with the catalyst, which contradicts the carbide theory of catalytic synthesis of hydrocarbons from CO and H<sub>2</sub> on these catalysts. If formation of liquid and solid hydrocarbons by hydrogenation of CO involves the carbide mechanism.



then the conclusion can be drawn from the exptl data obtained that equality of the reaction velocities of (a) and (c) is in accord with the carbide theory only in the case of Fe catalysts; for the Co and Ni catalysts the velocity of the process is considerably in excess of that in the process (a). All this speaks against the applicability of the carbide formation mechanism for the explanation of the chemical process occurring on the Co and Ni catalysts and in favour of ~~the~~ mechanism of synthesis of hydrocarbons from CO and  $H_2$  in the case of Fe catalysts. This is also supported by data previously reported by the author.

PROCESS AND PROPERTIES INDEX	
<p>Development of the multistep theory of catalysis in the light of recent data on reactions of hydrogenation and of atomic exchange. A. A. Haimanin and Ya. T. Khuz. <i>Izvestiya Khim.</i> 19, 18-20(1940). - Review with 77 references. N. Thon</p>	
<p>ASTM-55A METALLURGICAL LITERATURE CLASSIFICATION</p>	
<p>1940-1949</p>	<p>1950-1959</p>
<p>1960-1969</p>	<p>1970-1979</p>
<p>1980-1989</p>	<p>1990-1999</p>

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p>1191. SYNTHESIS OF LIQUID AND SOLID HYDROCARBONS FROM WATER GAS AT ATMOSPHERIC PRESSURE ON A PRECIPITATED <math>\text{Fe-Cu-ThO}_2\text{-K}_2\text{CO}_3</math>-MARSHALLITE CATALYST. Eidus, Ya. T. (J. Gen. Chem. (U.S.S.R.)), 1946, <u>16</u>, 869-874; Chem. Abstr., 1947, <u>41</u>, 1987).</p> <p>Pptd. <math>\text{Fe-CuThO}_2 - \text{K}_2\text{CO}_3</math>-marshallite catalyst was shown to have a rather high effectiveness in the synthesis of hydrocarbons from water gas at 250° at atm. pressure. The best catalyst contained 1/2 ratio between <math>\text{ThO}_2/\text{K}_2\text{CO}_3</math>, which were used in 2% amt. relative to Fe. Yields of solid paraffins as high as 13.6% are reported.</p>																			
A 11.11.1 METALLURGICAL LITERATURE CLASSIFICATION																			
120000 HAS ONLY ONE										120000 HAS ONLY ONE									
120000 HAS ONLY ONE										120000 HAS ONLY ONE									



**Synthesis of Some Olefinic Hydrocarbons from Primary Alkylmagnesium Halides and Carbon Monoxide Under Pressure.** Ya. T. Eidus, N. V. Klagina and N. D. Zelinskii.  
*U. O. P. Library Bulletin of Abstracts*, v. 21, Aug. 7, 1946, p. 12R. Abstracted from *Bull. Acad. Sci. URSS, Classe des Sciences Chimiques*, 672-674, 1945.

<p><i>Co</i></p> <p><b>PROPERTIES AND CHARACTERISTICS</b></p> <p>Catalytic hydrocondensation of carbon monoxide with ethylene. Ya. T. Illus and K. V. Pusitaki. <i>Compt. rend. acad. sci. U.R.S.S.</i> 94, 35-8(1960) (in English). Using the same method of prepn. as described previously (cf. C.A. 35, 4744) but using Co (I) and Co (II), differing in prepn., as catalysts, the catalytic interaction of CII<sub>4</sub> with CO in the presence of II at 700 mm. pressure, was studied. I proved insufficiently stable, II more stable. Results show that a hydrocondensation reaction of CO with CII<sub>4</sub> in the presence of II takes place; 75% by vol. of liquid product is formed at the expense of the initial CII<sub>4</sub>. The presence of a considerable amt. of O-contg. compds. was detected, particularly alcs. (H<sub>2</sub>O) was detected as the 3-nitrophthalate).</p> <p>M. M. Lutwak</p>		10
<p>450-55A METALLURGICAL LABORATORY CLASSIFICATION</p> <p>THIS REPORT</p> <p>CLASSIFIED BY AND DATE</p>		<p>CLASSIFIED BY AND DATE</p>

581. CATALYTIC HYDROCONDENSATION OF CARBON MONOXIDE ( AND HYDROGEN) WITH ETHYLENE. Eidus, J.T. and Pusitsky, K.V. (Compt. Rend Acad. Sci. U.R.S.S., 1948, vol. 54, 35-38; abstr. in Brit. Abstr., AII, Dec. 1948, 853). A mechanism for the polymerisation of  $\text{CH}_4$  radicals in Fischer-Tropsch condensations is postulated. Hydrocarbon chains of chemisorbed radicals are thought to be attached only to two centres of the catalyst surface. Additions of  $\text{CH}_2$  radicals to  $\text{C}_2\text{H}_4$  in the gas mixture occur at both C. Comparison of the products obtained on adding  $\text{C}_2\text{H}_4$  to a  $\text{CO-H}_2$  (1 : 2) mixture, passed over a Co catalyst at  $190^\circ$ , with those obtained in the absence of  $\text{C}_2\text{H}_4$ , shows a threefold increase in quantity of the org. oils and 3-6-fold decrease in the amount of  $\text{H}_2\text{O}$  formed. The oil, 75% of which originates from  $\text{C}_2\text{H}_4$ , contains mainly hydrocarbons but some  $\text{PrnOH}$  and other alcohols.

B.A.

26

**B**

**Certain Reactions of Carbon Monoxide Involving Acidic and Basic Compounds.** (In Russian.) Ya. T. Eidel. *Uspekhi Khimii* (Progress in Chemistry), v. 16, Sept.-Oct. 1947, p. 559-628.

Based on his own work and on the literature, the author reviews reactions of CO with metallic potassium, alkalies, basic salts of strong bases, ammonia, amines, water, alkali metals, alcohols, alcohols, phenolates, olefins, and ketones. Many of these reactions have not been thoroughly investigated and it is believed that they have good prospects for industrial utilization. 163 ref.

ASSOCIATE METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

INTERNAL INDEX

EXTERNAL INDEX

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

INTERNAL INDEX

EXTERNAL INDEX



EYDUS, YA. T.

FA-77T1

USSR/Chemistry - Ethylene, Polymerization May 1948  
With Methylene Radicals  
Chemistry - Polymerization, Catalysts for

"On the Condensation Action of Methylene Radicals on  
Ethylene," Ya. T. Eydus, Acad N. D. Zelinskiy,  
N. I. Ershov, 3 pp

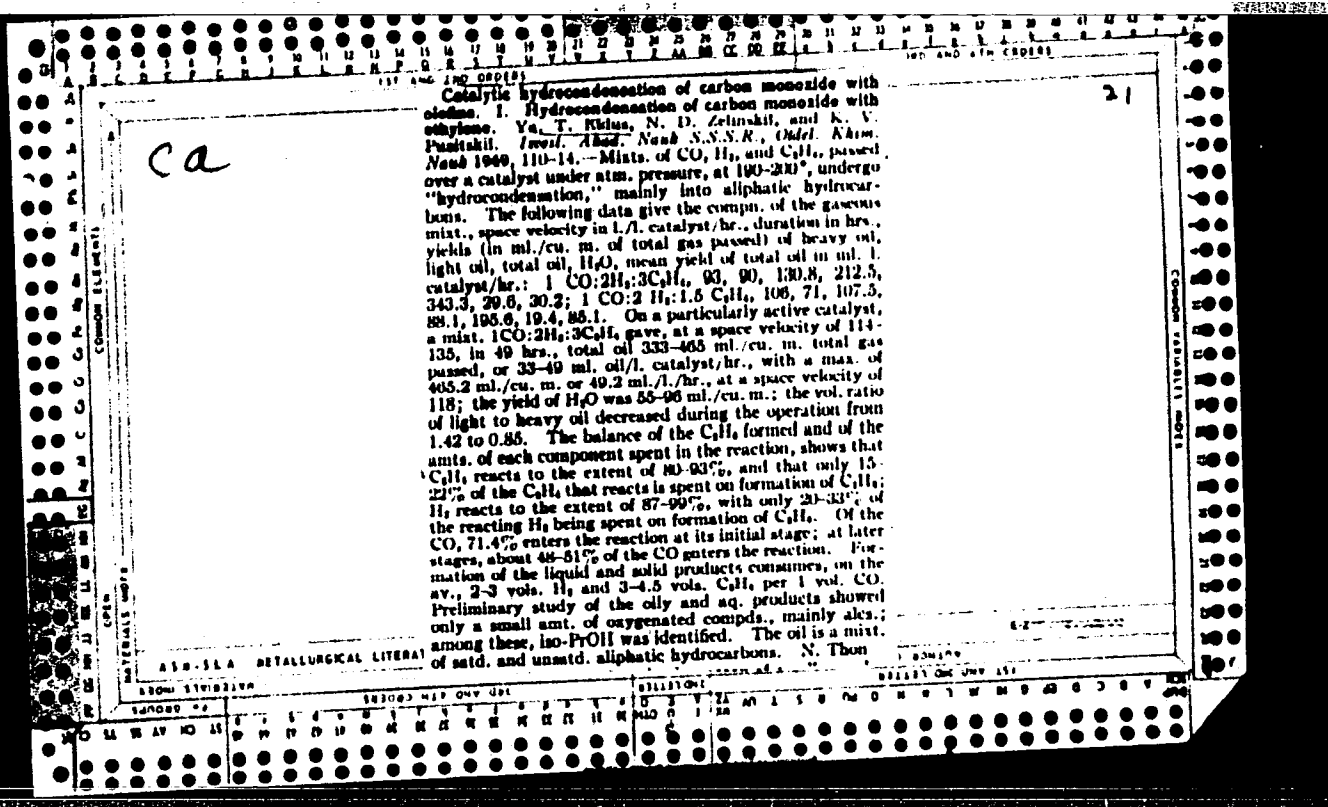
"Dok Ak Nauk SSSR" Vol LX, No 4

Report of experiments on above subject, which led to  
discovery of new catalytic hydropolymerization of  
ethylene in presence of small quantities of carbon  
monoxide. Submitted 10 Mar 1948.

77T1

Condensing action of methylene radicals on ethylene  
 Ya. T. Khlyus, N. D. Zelinskii, and N. I. Peshov. *Doklady Akad. Nauk S.S.S.R.* 60, 500-501 (1948). In hydro-  
 polymerization of  $C_2H_4$ , the most important role is  
 played by the  $CH_2$  radicals. Using, as a source of  $CH_2$ ,  
 radicals, mole of CO in the course of hydrogenation a new  
 reaction of catalytic hydro-polymerization of  $C_2H_4$ , was  
 discovered which proceeds only in the presence of small  
 units of CO. With an equimol. mixt. of  $C_2H_4$  and H,  
 contg. 4.7% CO, and a space velocity 100 at 100° and  
 atm. pressure, intensive hydro-polymerization takes place  
 on the catalyst surface (not specified); selection of the  
 conditions may restrict hydrogenation of  $C_2H_4$  to 25-30%  
 of the total reaction. The yields of liquid hydrocarbons  
 reach 400-500 ml./cu. m. or 30-45 ml./hr. Distn. of a  
 typical run showed the presence of 51% butylene, 4.1%  
 butane, 19% propylene, 3.3% propane, 18.2% ethane,  
 and 1.1%  $C_2H_6$ , in addn. to which appreciable units, (up  
 to 60-65%) of  $C_3$ - $C_6$  hydrocarbons are formed. Increase  
 of the CO content from 0.00 to 0.1% increases the amt. of  
 the heavy oil (in ml./cu. m.) from 0 to 61.3; the light oil  
 reaches a max. of 103.5 ml./cu. m. at 4% CO, while "gas-  
 oil" ( $C_4$  and lower) reaches a max. of 153.9 ml. cu. m. at  
 1.5% CO. Complete absence of CO leads to the failure of  
 formation of any higher oil; only hydrogenation to  $C_2H_6$   
 took place. G. M. Kosolapoff

ASB 31.6 METALLURGICAL LITERATURE CLASSIFICATION



EYDUS, YA. T.

USSR/Chemistry - Hydrocarbons, Liquid  
Chemistry - Condensation Compounds

May/Jun 49

"Catalytic Hydrocondensation of Carbon Monoxide with Olefines: No. II, Investigation of the Liquid Products of the Condensation of Carbon Monoxide with Ethylene,"  
Ya. T. Eydus, N. D. Zelenskiy, K. V. Puzitskiy, Inst. of Org. Chem., Acad. Sci., USSR,  
7 pp.

"Iz. Ak. Nauk SSSR, Otdel Khim Nauk" No. 3

Subject products are chiefly propanol, propionic aldehyde, propionic acid, and aliphatic saturated and unsaturated hydrocarbons. Formation of the hydrocarbons is effected by the methylene radical. Submitted 12 Mar 48.

56/49119

EYDUS, Y a,

28924. Spektly Pogdoshcheni Ya 2-nitroindanciona-1 s b Ul' traftodetovoy Oblasti.  
Izvestiya Akad. Nauk Latv. SSR, 1949 No. 8, s. 21-4 O-Na Latys. Yaz. Rezyume Ne  
Rus. Yaz. Bibliogr: 12 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 29, Moskva, 1949

CA

Effect of ammonia in the incoming gas on the catalytic hydrogenation of carbon monoxide to higher hydrocarbons. Ya. T. Il'ius and I. V. Glusova (Acad. Sci. U.S.S.R., Moscow): *Izv. Akad. Nauk, Otdel. Khim. Nauk* 1950, 287-90. — In 5-hr. runs with a mix. 1CO:2H<sub>2</sub> flowing at 80-90 l./l. catalyst/hr. at 190° under atm. pressure, over a Co catalyst (8 g. metal over 35 cm.), addn. of NH<sub>3</sub> resulted in marked decrease of the yield of higher hydrocarbons, without any increase of the amt. of CH<sub>4</sub>; the percentage of CO reacted is decreased in the same degree as the yield of hydrocarbons. A ppt. of (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> is formed at the end of the reactor. The effect of NH<sub>3</sub> is reversible, i.e. as soon as the NH<sub>3</sub> is shut off, the yield reverts to its original high level. Judging by the absence of MeNH<sub>2</sub> (also of Me<sub>2</sub>NH, Me<sub>3</sub>N, and CO(NH<sub>2</sub>)<sub>2</sub>) in the products, the inhibition by NH<sub>3</sub> is not due to a reaction  $\text{NiH}_2 + \text{CH}_4 \rightarrow \text{MeNH}_2$ . The formation of (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> can be attributed only to enhanced occurrence of the reaction  $\text{CO} + \text{H}_2\text{O} \rightarrow \text{CO}_2 + \text{H}_2$ , with CO<sub>2</sub> reacting further with NH<sub>3</sub>; in the absence of NH<sub>3</sub>, that reaction ordinarily comes to a halt as soon as the catalyst is formed, but not with NH<sub>3</sub> present. N. Thon

CA

Catalytic hydrocondensation of carbon monoxide with olefins. III. Polymerization and hydrocondensation of ethylene under the conditions of hydrocondensation catalysts. Ya. L. Khlos, N. D. Zelinskii, and K. V. Puzitskii. *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 98-107; cf. C.A. 45, 4820f; 46, 4409g. (1)  $C_2H_4$  alone and in mixt. with  $H_2$  was passed at 100° under atm. pressure, over catalyst III after it had been used for 120 hrs. in hydrocondensation of 1 CO:2  $H_2$ ;  $C_2H_4$  activity in that reaction is expressed by the production of 218-37 ml./cu. m. oil, or 21.1 ml./hr. at space velocity  $S = 101-14$ , gas contraction  $\epsilon = 31.3\%$ ,  $H_2O$  yield  $w = 20.8-30.5$  ml./cu. m. In a subsequent run with  $C_2H_4$  alone (80% pure),  $\epsilon$  was 12%, oil initially 02.7 ml./cu. m. (0.0 ml./hr.), falling to 32.8 (2.0). extent of reaction 13% of the  $C_2H_4$  passed,  $w = 15.7-32.8$  ml./cu. m. This shows that, in CO +  $H_2$  +  $C_2H_4$ , the liquid products cannot be due to a polymerization of  $C_2H_4$  itself. (2) In a subsequent run with 3  $C_2H_4$ :1  $H_2$ , the oil yield rose to 118.2 ml./cu. m. (9.7 ml./hr.),  $\epsilon$  to 32.2%, extent of reaction 46.7% of the  $C_2H_4$  passed, with 51.5% of the  $C_2H_4$  reacted spent on formation of liquid and solid products;  $H_2$  reacted to the extent of 71.8%.

with 34.1% of the  $H_2$  reacted spent in the formation of liquid and solid. In a subsequent run with 1  $C_2H_4$ :1  $H_2$ , the oil yield was 202.0 (20.2 ml./hr.), extent of reaction 87.7 and 72.7% of  $C_2H_4$  and  $H_2$  passed, resp., with 43.4 and 28.5% resp. of the  $C_2H_4$  and  $H_2$  reacted gone into the liquid and solid product. In 2 following runs with 1  $C_2H_4$ :1.2  $H_2$ , the  $C_2H_4$  reacted completely (100%), but only 20-25% of it went into the oil the yield of which fell to 40.6 (3.5). The same results were obtained, in an analogous series of runs, on catalyst IV. As a rule the proportion of light oil in the liquid product is markedly higher with  $H_2$  +  $C_2H_4$  than with CO +  $H_2$  +  $C_2H_4$ , and increases in consecutive runs. (3) Passage of  $H_2$  alone over a catalyst having been used in runs with CO +  $H_2$  +  $C_2H_4$ , produces no significant amts. of liquid, and no light oil. This proves that the hydrocondensation products obtained with  $H_2$  +  $C_2H_4$  are not due to a hydrocondensation of the solid deposit formed on the surface of the catalyst. (4) Passage of 1  $H_2$ :1  $C_2H_4$  on a fresh catalyst produced practically no oil, only hydrocarbons  $C_3$  with a yield of 6.2-14.0% with respect to  $C_2H_4$  passed, or 35-90.5 liquid ml. (at -80°) cu. m. gas passed. The main mass of the  $C_2H_4$  is hydrogenated to  $C_2H_6$ . (5) These results are interpreted as due to the presence of  $C_2H_4$ .

over

radicals at certain points of the lattice of the metallic catalyst surface having been used with  $\text{CO} + \text{H}_2 + \text{C}_2\text{H}_4$ . Wherever a  $\text{C}_2\text{H}_5$  group happens to be located in a suitable position between the ends of two mols. of  $\text{C}_2\text{H}_4$  adsorbed on the same surface, it serves as a bridge linking the  $\text{C}_2\text{H}_4$  mols. and leading to the formation of higher polymerization products. Such  $\text{C}_2\text{H}_5$  groups being absent at the surface of a fresh catalyst, the probability of higher polymerization is very slight, and there can only be dimerization of adjacent  $\text{C}_2\text{H}_4$  mols. into  $\text{C}_4$  products. N. Thun



F		R	
<p>1928. NEW FORMS OF SYNTHESIS OF HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN. Kikus, Ya. T. (Uspekhi Khim. (Progr. Chem.) Jan-Feb. 1950, vol. 19, 32-58). Reviews development of the above on the basis of the literature and the author's experience of the past 10 years.</p>			
		BLR	
		No. 1	
<p><i>Digest of article available - W-10482, 23 May 1950</i></p>			
<p>ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>1928.000 1928.000 1928.000 1928.000</p>			

CA

Catalytic hydrocondensation of carbon monoxide with olefins. IV. Hydrocondensation of ethylene with carbon monoxide at low concentrations of the latter... Ya. I. Likhin, N. D. Zelinskii, N. I. Kravtsov, and M. I. Ratuev (Inst. Org. Chem. Acad. Sci., U.S.S.R., Moscow). *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 377-85; cf. C.A. 44, 6100g. At 190°, under atm. pressure, mixts. of  $C_2H_4$  +  $H_2$  with small amts. of CO gave (with 3 different catalysts) the following yields (vol.-%  $C_2H_4$ ,  $H_2$ , CO in the initial gas, space velocity, length of run in hrs., yield (ml. cu. m.) of heavy oil, light oil, gas oil,  $H_2O$ ): 62.0, 37.5, 5.7; 104 1.4; catalyst hrs., 12.2 hrs., 80.3, 190.1, 285.4, 7.0; 48.9, 30.9, 7.0, 78, 47.0, 77.4, 224.8, 90.3, 21.3; 47.9, 38.5, 0.5, 85, 60.5, 38.7, 162.3, 100.4, 30.7. The compn. of the outgoing gas (vol.-%) in these 3 expts. was ( $C_2H_4$ ,  $H_2$ , CO,  $C_2H_6$ , resp.): 2.4, 35.7, 0.8, 43.9; 19.1, 20.0, 9.7, 38.8; 12.8, 18.3, 8.0, 51.0 (balance  $N_2$ ). The yield of liquid condensate (gas oil included) attains 30-45

ml. l. hr.  $C_2H_4$  reacts to the extent of 77.7-98.5%,  $H_2$  to 62.3-90.0%. CO is consumed mainly (up to 94.9%) in the beginning of the run, less at later stages. The fraction of the reacted  $C_2H_4$  converted to  $C_2H_6$  varies from 27.6 to 50.6%. At const. space velocity, 100 l. l. catalyst hr., with a gas mixt. contg. 8.7% CO, the optimum temp., in the 100-250° range, is 190-210°. By fractionation of the products from an equimol. mixt. of  $C_2H_4$  and  $H_2$ , contg. 4-7% CO, the gas oil constitutes about 30% of all org. products in the condensate, and consists (not including  $CH_4$ ) of  $C_{10}H_{22}$  1.1,  $C_{11}H_{24}$  18.2,  $C_{12}H_{26}$  19.0,  $C_{13}H_{28}$  3.3,  $C_{14}H_{30}$  54,  $C_{15}H_{32}$  4.1 wt.-%, or, in % of the org. matter in the condensate, resp., 0.35, 6.1, 6.3, 1.1, 18.1, 1.4%. More than half of the gas oil, 51 wt.-%, is the nonhydrogenated dimer of  $C_2H_4$ , namely  $C_4H_8$ ; the hydrogenated dimer,  $C_4H_{10}$ , is 4.1% (with respect to the wt. of the condensate,  $C_4H_{10}$  is 18.1,  $C_4H_8$  1.4%). The presence of a  $C_{10}H_{22}$  +  $C_{11}H_{24}$  fraction (22.3% of the gas oil, 7.4% of the condensate), with a  $C_{10}H_{22}/C_{11}H_{24}$  ratio of 0.2-0.3, indicates condensation of  $CH_3$  radicals with  $C_2H_5$ . Fractions  $C_6$  and  $C_7$  (trimers and tetramers of  $C_2H_4$ ) constitute, resp., 18.8 and 12.6% of the

condensate (with the gas oil sepl.); the presence of the fractions  $C_1$ ,  $C_2$ , and  $C_3$ , constituting, resp., 12, 16.5, and 8.5% of the gas oil-free condensate, indicates reaction with  $CH_3$  radicals. Unsaturated compounds attain up to 70% of the condensate. By Raman spectra of the hydrogenated catalyzate, the fractions b. 60-120.5° contain only the corresponding normal hydrocarbons, the fraction b. 60-68.5°, beside  $C_{11}H_{24}$ , also  $\sim 15\%$  2-methylpentane, and  $\sim 25\%$  3-methylpentane, the fraction b. 27-30° contains, beside  $C_{11}H_{24}$ , also  $\sim 15\%$  2-methylbutane. N. Thom

10

CA

Catalytic hydrocondensation of carbon monoxide with olefins. V. Hydrocondensation of carbon monoxide and propylene. N. D. Zelinskii, Ya. L. Kikly, K. V. Puzitskii, and M. I. Ratur. *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1930, 647-53; cf. C.A. 43, 1086, 45, 1485. As shown earlier, in the complete absence of CO, C<sub>3</sub>H<sub>6</sub> with H<sub>2</sub> under catalytic conditions, yields only C<sub>3</sub>H<sub>8</sub>, but in the presence of CO, polymers and hydrocarbons of odd- and even no. C atom hydrocarbons are formed. A similar reaction between propene and 5-7.7.0% CO at 100° and atmospheric pressure of H<sub>2</sub> with the previously described catalyst gives 85.00% conversion of the propene, of which 35% is propane; the yield of liquid condensate is 650 (600 ml./cu. m.). The yield of butylenes is 2.7%, that of C<sub>3</sub>H<sub>8</sub> 2.6%. The condensate freed of C<sub>2</sub> and C<sub>3</sub> products boils over a very wide range (130-225°) and contains about 35% unsaturates (mostly of lower mol. wts.). After hydrogenation over Raney Ni 75% of the condensate is 28-310°, and contains about 12-14% each of C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub>, and C<sub>5</sub> products, and about 20% C<sub>6</sub>. The C<sub>2</sub>-C<sub>6</sub> fractions contain some branched-chain products (Raman method), possibly 2- and 3-methylpentane, while the rest are n-hydrocarbons C<sub>2</sub>-C<sub>6</sub>. G. M. Kosolapoff

EYDUS, Ya. T.

Mar/Apr 51

USSR/Chemistry - Petroleum

"On the Essential Reversibility and Equilibrium of the Catalytic Polymerization of Methylene Radicals," Ya. T. Eydus, Inst. Org. Chem., Acad. Sci., USSR.

"Iz. Ak. Nauk SSSR, Otdel Khim Nauk" No. 2, pp. 129-132.

Examined concept of equilibrium between (1) catalytic polymerization of methylene radicals and (2) depolymerization of resultant "giant mol" (according to - R. Craxford). Found experimental data disprove, not support, this concept.

179T24

CA

110.2

Practical reversibility and equilibrium of the catalytic polymerization of methylene radicals. Ya. T. Rikus (Acad. Sci. U.S.S.R., Moscow). *Invest. Abstr. Nauk S.S.S.R., Otdel. Khim. Nauk*/1931, 129-32.—Cranford's (C.A. 42, 3648d) concept of an equil. between catalytic "plant mol." (C. and Rikus, *Discuss. Chem.* 20, 263 (1939); C.A. 33, 9806; 34, 1494), based largely on the ease of hydrogenolysis of higher hydrocarbons at as low as 185° (C. C.A. 41, 262g) and on the suppression of formation of  $CH_4$  in  $CO + H_2$  mixts. strongly dil'd. with  $CH_4$  (Prettre, *et al.*, C.A. 41, 3736e), accompanied by consumption of part of the  $CH_4$ , is a matter of misinterpretation of the observations. The concepts of C. are based on the carbide theory of the Fischer-Tropsch process, which was refuted by observation of E. and Zelinskii (C.A. 37, 3909; 39, 2391; 43, 8063d), confirmed by Weller, *et al.* (C.A. 42, 3560f). This theory is irreconcilable with the predominant formation of  $CH_4$ , to the exclusion of higher hydrocarbons, in the reaction  $2CO + 2H_2 \rightarrow CH_4 + CO_2$  at 225° (F. Fisher and K. Meyer, C.A. 23, 4685) and with the observations of Prettre, *et al.* (*loc. cit.*) which prove that production of higher hydrocarbons does not require formation of carbides. The assumption of a reaction between  $CH_4$  and  $CH_3$  radicals was based on the simultaneous reactions  $C_2H_5 +$

$H_2 \rightarrow 2CH_3$ , and  $2C_2H_5 \rightarrow 2CH_3 + C$  (Mitsunaka, *et al.*, C.A. 30, 7435d), the 2nd of which calls for absorptive dissociation of  $CH_3$  into  $H + CH_2$ , and further of  $CH_2$  into  $H + CH$ , and  $CH$  into  $H + C$ . Actually, there is no proof of a reaction  $2CH_3 \rightarrow C_2H_6 + H_2$ . Nor is it in any way proved that the effect of the diln. of the  $CO + H_2$  mixt. by  $CH_4$  is due to a shift of the  $CH_3$  formation as a result of its mass action. On the contrary, diln. with  $N_2$  has the same effect as diln. with  $CH_4$  (Perrin, C.A. 41, 3739f). Any sufficient lowering of the partial pressure of  $CO + H_2$  will suppress the production of  $CH_4$ , and so will a lowering of the temp. from 190 to 175°. In an undil'd.  $CO + H_2$  mixt. on a fresh catalyst, the original temp. of 190° rose, through spontaneous overheating, to 240°. This overheating is the cause of production of  $CH_4$  at the expense of higher hydrocarbons; the latter become the dominant product when the temp. falls to 200-210°. Any factor counteracting the spontaneous overheating, including diln., will counteract production of  $CH_4$ . The similarity of the product distribution curves of hydrogenolysis of high hydrocarbons, and of synthesis from  $CO + H_2$ , with both curves showing a max. at a certain C chain length, cannot be invoked as evidence in favor of the polymerization-depolymerization equil. theory, as the max. lies at  $C_4$  in the case of the synthetals, and at  $C_6-C_8$  in the case of the hydrogenolysis, which is incompatible with an equil.

CA

Catalytic hydrogenation of carbon monoxide with olefins. VI. Hydrocondensation of carbon monoxide with normal butylene. Ya. T. Khuz. N. I. Khrav, M. I. Baturv, and N. D. Zelinskii (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izv. Akad. Nauk S.S.S.R., Otd. Khim. Nauk* 1951, 722-7; cf. C.A. 41, 3741b; 43, 108a; 43, 1494; 4437d. — An equimol. mixt. of H<sub>2</sub> and C<sub>4</sub>H<sub>8</sub> with 4-6% CO, passed at 100° under atm. pressure over the catalyst at a space velocity of 80-120 l./l. catalyst/hr., formed 656.8 ml./cu.m., or 55 ml./l. catalyst/hr. of liquid condensate. Examples of analyses are: With the initial gas composed of C<sub>4</sub>H<sub>8</sub> 37.0, H<sub>2</sub> 46.6, CO 6.1, N<sub>2</sub> 10.3 vol.-%, the outgoing gas was C<sub>4</sub>H<sub>8</sub> 3.2, H<sub>2</sub> 35.4, CO 0.0, C<sub>4</sub>H<sub>10</sub> 74.0, N<sub>2</sub> 24.0 vol.-%; reacted (in % of the amt. of original component) C<sub>4</sub>H<sub>8</sub> 97.1, H<sub>2</sub> 74.2, CO 100%; C<sub>4</sub>H<sub>10</sub> formed (in % of the component reacted) from H<sub>2</sub> 33.4, C<sub>4</sub>H<sub>8</sub> 32.2, initial gas 42.7, 47.6, 2.6, 7.1, outgoing gas 40.0, 4.8, 0.0, 26.6, 18.4, reacted 70.4, 98.9, 100, C<sub>4</sub>H<sub>10</sub> formed 25.1, 38.5%. An example of the compn. of the liquid (with 4.0 vol.-% CO, 102 l./l. catalyst/hr., 30 hrs.) is, total oil 511.0 ml./cu.m. (of which heavy oil 180.1, light oil 331.8), 11.6% C<sub>4</sub>H<sub>10</sub>, yield of total oil 47.3 ml./l. catalyst/hr. The condensate, freed from gas oil (C<sub>4</sub>), b. between 28 and 278°, consists of aliphatic hydrocarbons, and contains about 24% of unsatd. compds. After hydrogenation, 77.5% of the liquid condensate b. between 28 and 152°; it consists of about 24% C<sub>4</sub> fraction (half of it isopentane), 15% C<sub>5</sub>, 8% C<sub>6</sub>, 8% C<sub>7</sub>, and 9% C<sub>8</sub>. N. Thon

EYDUS, YA. T.

USSR/Chemistry - Synthetic Fuels Nov/Dec 51

"Catalytic Hydrocondensation of Carbon Monoxide  
With Olefins. VI. Hydrocondensation of Carbon Mon-  
oxide With n-Butene," Ya. T. Eydus, M. I. Krshov,  
M. I. Betuyev, M. D. Zelinskij, Inst Org Chem, Acad  
Sci USSR

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 6, pp 722-727

Continuing investigation of reaction discovered by  
them in 1946, authors studied hydrocondensation of  
CO with n-butene at 190° and 1 atm in the presence  
of 4-6% CO and equimolar quantities of n-butene and  
H<sub>2</sub>. Yield of liquid condensate amounts to 635

1977

USSR/Chemistry - Synthetic Fuels Nov/Dec 51  
(Contd)

ml/m<sup>3</sup> (or 55 ml/l per hr. 97% of n-butene react;  
30-37% under formation of butane). The liquid con-  
densate freed from gasol (C<sub>4</sub>) boils in the range  
28-276°. It consists of paraffin hydrocarbons and  
28% unsatd compds. On hydrogenation 77.5% of the  
liquid condensate distills between 28-152°. The  
compn then is 24 vol-% C<sub>5</sub> (half of it isopentane),  
15% C<sub>6</sub>, 8% C<sub>7</sub>, 8% C<sub>8</sub>, 9% C<sub>9</sub>.



USSR/Chemistry - Synthesis of  
Hydrocarbons

Jan/Feb 51

"Mechanism of the Synthesis of Hydrocarbons from  
Carbon Monoxide and Hydrogen," Ya. T. Eydus,  
Moscow

"Uspekhi Khim" Vol XX, No 1, pp 54-70

Discussion of mechanisms of reactions for synthesis  
of hydrocarbons from  $H_2$  and  $CO$ , based largely on  
non-Russian work (with the exception of research by  
Eydus, N. D. Zelinskii, et al) covering developments  
after 1940 (when Eydus published previous review of  
subject), and supplementing a 1950 report by him

193T7

USSR/Chemistry - Synthesis of  
Hydrocarbons (Contd) Jan/Feb 51

devoted to new types of reactions and catalysts.  
Deals at length with the problem of formation of  
 $CH_2$  radicals.

EYDUS, YA. T.

193T7

USSR/Chemistry - Organometallic  
Compounds

Sep/Oct 51

"Review of S. T. Ioffe and A. N. Nesmeyanov's 'Handbook of Magnesium-Organic Compounds,' I-III," Ya. T. Eydus

"Uspekhi Khim" Vol XX, No. 5, pp 671, 672

Reviews in some detail this work, which is a part of the series "Synthetic Methods in the Field of Organometallic Compounds" published under the general editorial supervision of Acad A. N. Nesmeyanov and K. A. Kocheshkov, Corr Mem, Acad Sci USSR. States that all references to reactions involving Mg-org compds and listed in "Chem Zentralblatt," 1899 - 1940, and "Chem Abstracts," 1941 - Jan 1, 1948, as well as Russian and USSR work in this fld not listed by these 2 journals (altogether more than 13,000 reactions) have been included in the handbook. According to Eydus, the handbook is well published and indexed. Published by Press Acad Sci USSR, M-L, 1950.

191714

EYDUS, Ya.

USSR.

✓ Tautomerism and isomerism of 2-nitro-1,3-indandione.  
G. Vannoz, Ya. Elduz, and S. Giller. Doklady Akad.  
Nauk S.S.S.R. 79, 577-80 (1951).—The structure of 2-  
nitro-1,3-indandione was studied by investigating the ultra-  
violet absorption spectrum of this compd. and its deriva-  
tives in H<sub>2</sub>O, EtOH, 0.1N H<sub>2</sub>SO<sub>4</sub>, ether, and dioxane. The spec-  
tra of the chloro-, bromo-, and iodo-2-nitro-1,3-indandione  
in ether were also studied. The spectra of the isomeriza-  
tion products were also used to det. their structure. The  
keto form exists in solvents having a large dielec. perme-  
ability. J. Rovtar Leach

NESMEYANOV, A.N., akademik, otvetstvennyy redaktor; BOBROV, P.A., doktor khimicheskikh nauk, otvetstvennyy redaktor; YELIZAROVA, A.N., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; KAPLAN, Ye.P., kandidat khimicheskikh nauk, sekretar'; LIBERMAN, A.L., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; MAGIBINA, T.D., kandidat khimicheskikh nauk, chlen redaktsionnoy kollegii; HODENKO, V.A., kandidat khimicheskikh nauk, samostitel' otvetstvennogo redaktora; BYDUS, Ya.T., doktor khimicheskikh nauk, chlen redaktsionnoy kollegii.

[Syntheses of organic compounds] Sintezy organicheskikh khimii. Moskva, Izd-vo Akademii nauk SSSR. Vol.2. 1952. 190 p. (MLRA 6:5)

1. Akademiya nauk SSSR, Institut organicheskoy khimii.  
(Chemistry, Organic)

EYDUS, YA. T.

USSR/Chemistry - Hydrocondensation Jan/Feb 52  
 "The Catalytic Hydrocondensation of Carbon Monoxide  
 with Olefins. VII: Effect of the Concentration  
 of Carbon Monoxide on Its Hydrocondensation With  
 Propene and n-Butene," Ya. T. Eydus, N. D. Zelinskij,  
 K. V. Puzitskiy, N. I. Yershov, Inst of Org Chem,  
 Acad Sci USSR  
 "Iz Ak Nauk, Otdel Khim Nauk" No 1, 1952, pp 145-151  
 Hydrocondensation of propene-hydrogen and butene-  
 hydrogen mixts does not occur in absence of CO.  
 Reaction rate of hydrocondensation of propene and  
 butene is highest with 6-8% CO in the original  
 gas mixt. If the original mixt contains 15-20%  
 CO, hydrocondensation with propene and butene is  
 sharply retarded, as distinguished from the same  
 process carried out with ethylene.

USSR/Chemistry - Hydrocondensation Jan/Feb 52  
 (Contd)

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EYDUS, Ya.T.; FUZITSKIY, K.V.; BATUYEV, M.I.

Catalytic hydrocondensation of carbon monoxide with olefins. VIII. Hydrocondensation of carbon monoxide with isobutylene. Izvest. Akad. Nauk S.S.S.R. Otdel Khim. Nauk '52, 978-81. (MLRA 5:11)  
(CA 47 no.21:11122 '53)

1. Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow.

EYDUS, Y. F.

Chemical Abst.  
Vol. 48 No. 4  
Feb. 25, 1954  
Organic Chemistry

~~Catalytic hydrocondensation of carbon monoxide with olefins. Ex. Kuznetsov, N. I. and L. V. Guseva. Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow. Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1952, 1075-81; cf. C.A. 46, 11095a; 11122a.~~—Since mixts. of  $C_2H_4$  with  $H_2$  and  $CO$  condense, it was expected that compds. able to decomp. into  $CO$  and  $H_2$  would also enter a condensation reaction scheme, olefins on the same catalysts. The expected reaction scheme, involving intermediate  $CH_3$  radicals, for  $MeOH$  is,  $MeOH + CH_3:CH_3 \rightarrow (CO + 2 H_2 + CH_3:CH_3) \rightarrow (CH_3 + H_2O + MeCH:CH_2) \rightarrow MeCH:CH_2 + H_2O$ ;  $MeOH + MeCH:CH_2 \rightarrow (CO + 2 H_2 + MeCH:CH_2) \rightarrow (CH_3 + H_2O + MeCH:CH_2) \rightarrow MeCH:CH_2 + H_2O$ , etc. Similarly, with  $EtOH$ , one can expect a build-up of higher hydrocarbons according to the scheme  $EtOH + CH_3:CH_3 + H_2 \rightarrow (CO + 2 H_2 + CH_3:CH_3 + CH_3) \rightarrow (CH_3 + H_2O + CH_3:CH_3 + CH_3) \rightarrow MeCH:CH_2 + H_2O + CH_3$ ;  $MeCH:CH_2 + CH_3 \rightarrow EtCH:CH_2 + H_2O$ ;  $EtOH + H_2 \rightarrow (CO + 2 H_2 + MeCH:CH_2 + CH_3) \rightarrow EtCH:CH_2 + H_2O + MeCH:CH_2 + CH_3 \rightarrow EtCH:CH_2 + H_2O + MeCH:CH_2 + CH_3 \rightarrow EtCH:CH_2 + H_2O + MeCH:CH_2 + CH_3$ , etc. Expts. have confirmed this. Mixts. of  $C_2H_4$  and  $H_2$  were bubbled through liquid  $MeOH$  or  $EtOH$  and so charged with known amts. of alc. vapor, and passed, at  $200^\circ$ , over catalysts, partly fresh and partly having served previously in hydrocondensation of  $C_2H_4$  +  $H_2$  +  $CO$ . For example (with  $MeOH$  counted as  $CO + 2 H_2$ ) 47.6 vol.-%  $C_2H_4$ , 46.7 vol.-%  $H_2$ , and 6.7 vol.-%  $CO$  at a space velocity of 81; yields 4.0%  $C_2H_6$ , 26.5%  $H_2$ , 3.1%  $CO$ , and 60.4 vol.-%  $C_2H_4$ ; % reacted, 97.2  $C_2H_4$ , 81.3  $H_2$ , 81.8  $CO$ ; liquid space velocity for  $MeOH$ , 0.01;  $C_2H_6$  produced in % of  $C_2H_4$  reacted, 47.6; wt.-%  $MeOH$  reacted, 77.6. In this run, the yield of heavy oil was 7.9 ml./cu. m., light oil 122.8 ml./cu. m., gas oil ( $C_7-C_{10}$ ) 154.6 ml./cu. m.; total yield of oil, 285.3 ml./cu. m. (23.2 ml./l. hr.); mole ratio  $MeOH:H_2:C_2H_4$  reacted, 1:3.2:5.2. The  $CO$  present in the final

(OVER)

product corresponds to that part of MeOH which was decompd. without entering condensation. The fractions of  $C_2H_4$  or  $H_2$  consumed in the hydrocondensation are obtained by deducting the amts. corresponding to production of  $C_2H_4$  from the total amts. reacted. The percentage of MeOH reacted varied from 60 to 90%; from 68 to 100% of it enters the hydrocondensation, and 32-0% appears as CO. The percentage of  $C_2H_4$  reacted varied from 69 to 90.5%, of which, depending on conditions, from 22 to 85% is hydrogenated to  $C_2H_6$ . The mole ratio MeOH: $H_2$ : $C_2H_4$  reacted, roughly 1:3:5, is close to the mole ratio CO: $H_2$ : $C_2H_4$  reacted in condensation CO +  $H_2$  +  $C_2H_4$ . The yields of condensate are also close, and so are the properties of the oil fractions; an example is, fraction b. below 150°, yield 67.3 vol.-%, unsatd. hydrocarbons 67%; b. 150-220°, 15.5, 48; residue 17.8. An example of a run with  $C_2H_4$  +  $H_2$  + EtOH, at 200°, is: calcd. compn.,  $C_2H_4$  24.8,  $H_2$  46.0, CO 14.6,  $CH_4$  14.6, vol.-% space velocity 183; compn. of final gas,  $C_2H_4$  2.0,  $H_2$  37.9, CO 2.2,  $C_2H_6$  57.9%; % reacted,  $C_2H_4$  97.3,  $H_2$  72.8, CO 93.7; liquid space velocity for EtOH, 0.11;  $C_2H_4$  produced, in % of  $C_2H_4$  reacted, 18.2; wt.-% EtOH reacted 72.6; yield of heavy oil 11.7, light oil 87.4, gas oil 128.1 ml./cu. m., total oil 237.3 ml./cu. m. (88.4 ml./l. hr.). The fraction of EtOH reacted, depending on its space velocity, 0.04-0.11, varied from 58.3 to 72.6%, of which 88-97% enters hydrocondensation with  $C_2H_4$ , and only 3-12% appears as CO. The percentage of  $C_2H_4$  reacted is 90-9%, of which 18-87% is hydrogenated to  $C_2H_6$ . In the liquid condensate, the fraction b. below 150° (60 vol.-%) contains 36% unsatd. compds.; b. 150-210° (11.6), 30; residue 4.2%. The 1st fraction contains a small amt. of org. O compds.

N. Thon

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7-28-54



"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231

REYDUS, Y/T.

APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231C

1. EYDUS, Ya.T.
2. USSR (600)
4. Fuel
7. Synthesis of motor fuel from carbon monoxide. Priroda. 41, no. 10, 1952.
9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

EYDUS, YA. T.

IR 247117

USSR/Chemistry - Aromatic Hydrocarbons

21 Nov 52

"Methylation of Cyclohexene With the Methylene Radical," Ya. T. Eydus and N. I. Yershov, Inst of Organic Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 87, No 3, pp 433-436

The catalytic hydrocondensation of cyclohexene and carbon monoxide is studied. It was found that methylation due to the action of  $H_2 + CO$  occurs in the 1 and 2 positions of cyclohexene. Presented by Acad B. A. Kazanskiy 19 Sep 52.

245T13

EYDUS, Ya. I.

✓ Catalytic hydrocondensation of carbon monoxide with pla-  
 ting. X. The behavior of cyclohexene in hydrocondensation  
 catalysis. Ya. T. Eklus and N. I. Brashov (Inst. Org. Chem.  
 Acad. Sci. U.S.S.R., Moscow). Izv. Akad. Nauk S.S.  
 S.R., Otdel. Khim. Nauk 1953, 704-12; cf. C.A. 48, 6071c.—  
 In the hydrocondensation of cyclohexene with CO and H  
 in the presence of  $C_{12}H_4$ , there take place reactions of irre-  
 versible catalysis, with formation of  $C_{12}H_4$  and cyclohexene,  
 along with hydrogenation to cyclohexane and methylation,  
 which yields methyl- and 1,2-dimethyl-substituted cyclo-  
 hexenes. In expts. without  $C_{12}H_4$ , the main mass of the  
 products consists of methylated 6-membered rings, such as  
 methyl- and 1,2-dimethylcyclohexenes; apparently no 1,3-  
 and 1,4-di-Me derivs. formed. G. M. Kosolapoff

EXBUS, Ya. I.

USSR.

Semiconduct hydrogenation and dehydrative condensation  
in the mechanism of isobutylene. Ya. P. Fridman. *Dokl.  
Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1953, 113-20 (Engl.  
translation).—See C.A. 49, 2280y. H. L. H.

EYDUS, YA T.

USSR/Chemistry - Hydrocarbon  
Synthesis, Catalysts Nov/Dec 53

"Semi-Catalytic Hydrogenation and Dehydrating Condensation in the Isosynthesis Reaction Scheme,"  
Ya. T. Eyduş, Inst Org Chem, Acad Sci USSR

Iz Ak Nauk SSSR, OZhN, No 6, pp 1024-1034

In the synthesis of hydrocarbons from CO and H<sub>2</sub> on non-hydrogenating oxide catalysts (Al<sub>2</sub>O<sub>3</sub>, ThO<sub>2</sub>), i.e. in isosynthesis, the mols of CO are activated on the surface of the catalyst and remain attached to that surface, while the mols of H<sub>2</sub> are activated thermally and react from the gas vol without

273T11

becoming attached to the catalyst. CHOH groups participate together with CH<sub>2</sub> in the formation of hydrocarbon chains in this synthesis. Iso-compds are then formed by catalytic condensation under elimination of water.

1. KAZANSKIY, B.A.; EIDUS, YA.T.
2. USSR (600)
4. Hydrocarbons
7. "Chemical utilization of petroleum hydrocarbon gases." A.S. Nekrasov, B.A. Krantsel',  
Reviewed by B.A. Kazanskiy, YA. T. Eidus, Usp.khim. 22 no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

EIDUS, YA. T.

USSR/Chemistry - Fuels

Jul 53

"Polymerization and Other Transformations of Ethylene and Propylene Under the Action of Heat, Free Radicals, and Other Active Particles," Ya.T. Eidus and K.V. Puzitskiy (Moscow)

Zhur Prikl Khim, Vol 22, No 7, pp 838-877

Discusses the thermal polymerization of ethylene (I) and propylene (II) under pressures both below and above atm. Goes on to discuss the polymerization of I and II under the action of photons, excited metal atoms, free atoms, and radicals. Also discusses the polymerization of I and II in

273T29

electrical discharge fields (electropolymerization). Bibliography consists of 204 references of which 25 are Russian and the remainder of western origin.

273T29





~~KYDUS, Ya. A.~~; PUZITSKIY, K.V.; GUSEVA, I.V.

Catalytic condensation of carbon monoxide with olefins. Report no.13. Effect of the ethylene-hydrogen relation in the initial gas, of nitrogen dilution, and of volume velocity on the hydrocondensation of carbon monoxide with ethylene. Izv.AN SSSR Otd. khim.nauk no.5:890-897 S-O '54. (MLRA 8:3)

1. Institut organicheskoy khimii im. N.D.Zelinskogo Akademii nauk SSSR.

(Condensation products (Chemistry)) (Carbon monoxide)  
(Ethylene)

EYDUS, Ya. T.

AID P - 1311

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 5/5

Authors : Eydus, Ya. T. and Puzitskiy, K. V. (Moscow)

Title : Catalytic polymerization of ethylene and propylene

Periodical : Usp. khim., 23, no. 8, 986-1026, 1954

Abstract : The catalytic effect of mineral acids, metallic halides and of heterogeneous catalysts on the polymerization of ethylene and propylene is covered. 220 references (32 Russian: 1873-1951).

Institution : None

Submitted : No date

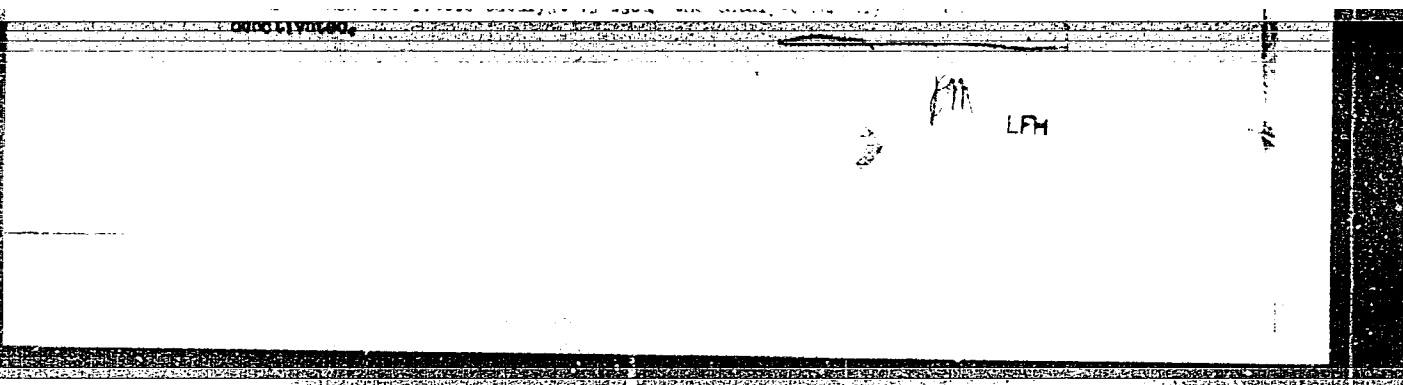
4637. THE ROLE OF SEVERAL GAS MIXTURE COMPONENTS IN THE COURSE OF THE  
CATALYTIC HYDROCONDENSATION OF CARBON MONOXIDE WITH ETHYLENE

3 6

...the role of the gas mixture components in the course of the  
catalytic condensation with ethylene occurs in the presence  
of ethylene polymerize in the absence of carbon monoxide.  
...the material for the hydrocondensation reaction and  
the initiators of the alkylene hydropolymerization reaction and the role of  
condensation with carbon monoxide. The optimum ethylene concentration in  
the mixture is 2.5-3. The dilution of the mixture with nitrogen  
...with a corresponding drop in the basal yield.

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CIA-RDP86-00513R00041231



APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041231(

~~EYDUS, Ya.T.~~  
EYDUS, Ya.T.

USSR:

Catalytic hydrocondensation of carbon monoxide with olefins. XI. Behavior of trimethylolpropane and tetramethylolpropane in hydrocondensation catalysts. Ya. T. Riden, E. V. Puzitskiy, and A. P. Kuznetsov (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Dokl. Akad. Nauk S.S.S.R., Otd. Khim. Nauk* 1954, 140-50; *Dokl. Akad. Sci. U.S.S.R., Div. Chem. Sci.* 1954, 123-6 (English translation); cf. *C.A.* 49, 4510h. — A study of hydrocondensation of CO with  $\text{Me}_3\text{C:CHMe}$  and  $\text{Me}_3\text{C:CMe}_2$  showed that  $\text{Me}_3\text{C:CHMe}$  enters hydrocondensation only to the extent of 5-8% while 30-5% is hydrogenated to isopentane;  $\text{Me}_3\text{C:CMe}_2$  enters hydrocondensation with CO to the extent of 10%, while 50% is hydrogenated to 2,3-dimethylbutane. The hydrocondensation products were not identified. Dehydration of  $\text{iso-AuOH}$  over  $\text{Al}_2\text{O}_3$  at 450-500° gave mixed  $\text{iso-PrCH:CH}_2$ ,  $\text{Me}_3\text{C:CHMe}$  and  $\text{MeEtC:CH}_2$ ; the mixt. was treated with dil.  $\text{H}_2\text{SO}_4$  with ice cooling, and the aq. layer sep'd. and dild., yielding 45%  $\text{Me}_3\text{C:CHMe}$ ,  $b_p$  57-8°,  $d_4$  0.6560,  $n_D^{20}$  1.3850.  $\text{Me}_3\text{CAc}$  was hydrogenated over 30% Ni catalyst (cf. Bag, et al., *C.A.* 28, 2658f) at 80-100 atm. H and 160-200°; the resulting  $\text{Me}_3\text{CCH(OH)Me}$ ,  $b_p$  118-20°, dehydrated over  $\text{Al}_2\text{SO}_4$  27 hrs. at 275° gave, after extensive fractionation,  $\text{Me}_3\text{C:CMe}_2$ ,  $b_p$  71-3°,  $d_4$  0.7075,  $n_D^{20}$  1.4128. G. M. K.

AB  
Jaw

EYDUS, Ya. T.

# USSR

Catalytic hydrocondensation of carbon monoxide with olefines.  
XII. Hydrocondensation of carbon monoxide with hex-1-ene.

Ya. T. Eydus, N. I. Yershov, and Ye. M. Terent'eva. XIII. Effects of varying the ratio of ethylene to hydrogen in the initial gas, of dilution with nitrogen, and of varying the rate of flow on hydrocondensation of carbon monoxide with ethylene. Ya. T. Eydus, K. V. Puzitskii, and I. V. Gusova (*Izvestia Akad. Nauk SSSR, Otdel. Khim. Nauk*, 1954, 882-889, 890-897).—XII. The main product obtained when 1 : 3 hex-1-ene- $H_2$  mixtures are passed over an unspecified catalyst at 190° is  $n-C_6H_{14}$  (71% yield), with about 9% of higher b.p. hydrocarbons ( $C_7$  or more). Mixtures containing hex-1-ene 55-61, CO 4-6-7, and  $H_2$  34-38% give 38-40% yields of higher hydrocarbons, and only 35-38% yields of  $n-C_6H_{14}$ .

XIII. The highest yields of oils from  $C_2H_4$ -CO- $H_2$  mixtures containing 3-6% of CO are obtained with 3 vol. of  $C_2H_4$  to 1 vol. of  $H_2$ ; the content of unsaturated hydrocarbons in the gasoline fraction rises steeply as the  $C_2H_4$  :  $H_2$  ratio rises from 1 to 3. The overall yield of oils falls with increasing dilution with  $N_2$ , from 4-8 to 71%; the yield of heavy oil is const. over this range, of light oil rises, and of gasoline falls, as the  $N_2$  content rises from 5 to 55%. The yields calculated as ml. of oil per cu. m. of gas are unaffected, and calculated as ml./hr. rise linearly when the rate of flow of the gas is increased.

R. TRUSCOE.

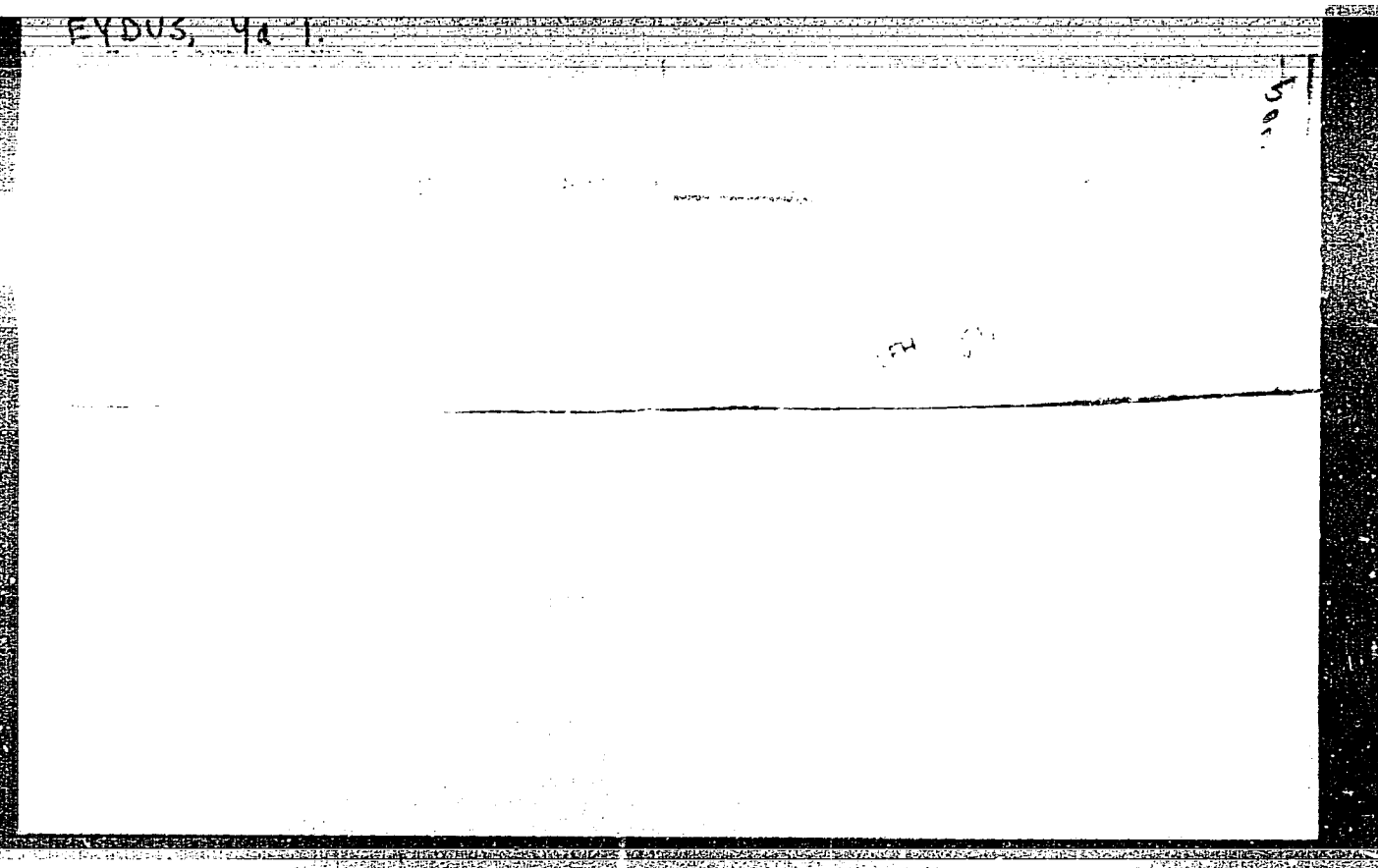
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EYDUS, Ya.T.

*Chun* Mechanism of semicontact hydrogenation of carbon monoxide under pressure. Ya. T. Eydus (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Kataliticheskie Gidrirovaniia i Oksileniia, Akad. Nauk Kazakh. S.S.R. Trudy Konf.* 1955, 27-37.—The so-called semicontact hydrogenation of CO, or "isosynthesis" (cf. Pichler, *et al.*, *C.A.* 44, 818c) is discussed in respect to its probable mechanism. By assuming the semicontact hydrogenation step, i.e. a step in which  $H_2$  rather than  $2H$  react, the formation of  $MeOH$  and  $MeCH(OH)CH_2OH$  is readily explainable. The catalysts used in this synthesis have high dehydration ability, on the basis of which the complete mechanism of isosynthesis involves the above semicontact hydrogenation and dehydrative condensation to yield the isostructures of final hydrocarbons. G. M. Kosolapoff

*PM*





*Eydus, Ya T.*

USSR/Physical Chemistry - Kinetics, Combustion,  
Explosives, Topochemistry, Catalysis

B-9

Abs Jour : Referat Zhur - Khim., No 2, 1957, 3667

Author : Eydus Ya.T., Izmaylov B.T.

Inst : Department of Chemical Sciences, Academy of Sciences USSR

Title : Catalytic Hydro-Condensation of Carbon Monoxide with  
Olefins. Communication 14. Mutual Transformation of  
Butene-1 and Butene-2 Under Conditions of Catalytic  
Hydro-Condensation of Carbon Monoxide with Olefins. Commu-  
nication 15. Hydro-Condensation of Carbon Monoxide with  
Butene-2.

Orig Pub : Izv. AN SSSR, Otd. khim. n., 1956, No 4, 467-474, 475-481

Abstract : 14. Investigation of the reaction of isomerization of  
butene-1 (I) to butene-2 (II) and of II to I, at 190° and  
space velocity 66-100 hour<sup>-1</sup>, over catalysts of the reac-  
tion of hydro-condensation of CO with olefins. It is  
shown that in the absence of H<sub>2</sub> the reactions I → II and

Card 1/3

- 154 -

USSR/Physical Chemistry - Kinetics. Combustion.  
Explosives. Topochemistry. Catalysis

B-9

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3867

II  $\rightarrow$  I are practically not taking place, in the presence of 10%  $H_2$  the I:II ratio in the products of the reaction I  $\rightarrow$  II is of 1:1.1. The reaction II  $\rightarrow$  I is practically not taking place even in the presence of 22.6%  $H_2$ . Hydrogenation of olefins in the experiments with I occurs  $\sim$  2 times more rapidly than with II under analogous conditions.

15. The reaction of hydro-condensation of CO with II was investigated in a flow system at 190° and  $p = 1$  atmosphere, in a glass tube. It was found that the reaction products contain essentially hydrocarbons of a normal structure admixed with hydrocarbons with a lateral  $CH_3$ -group at the second atom of the carbon chain. From this the authors draw the conclusion that II, as such, reacts only to a slight extent, but undergoes catalytic isomerization to I, which remains in its entirety

Card 2/3

- 155 -

EYDUS, 4a.T

<sup>27</sup>  
/Catalytic hydrocondensation of carbon monoxide with olefins.  
XVI. Hydrocondensation of carbon monoxide with but-1-ene.  
Ya. T. Fikse and R. I. Izmailov (Izv. Akad. Nauk SSSR  
Khim. Nauk, 1958, 721-729).—Catalytic condensation of CO  
but-1-ene and H<sub>2</sub> at 190° and atm. pressure is discussed, with and  
without addition of 10-30% of but-2-ene. With a gas mixture  
of 70-75 of but-1-ene, 20-25 of H<sub>2</sub>, and 4-6% of CO, liquid  
condensate yield averaged 100 ml./hr. 74.4% of but-1-ene  
reacted, 9.4% hydrogenating into butane and ~15% isomerizing  
into but-2-ene. The liquid condensates, freed from C<sub>4</sub> fractions  
and isopentene, contained <52% of unsaturated hydrocarbons.  
In same conditions, with up to 25% of but-2-ene in gas mixture, no  
difference was noted in yield of liquid condensates. Reaction  
products after hydrogenation were mainly saturated hydrocarbons  
of normal structure and contained insignificant amounts of hydro-  
carbons with one methyl side-group on the second atom of the  
hydrocarbon chain. A. L. B.

PM for any